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JUNE 6, 1955

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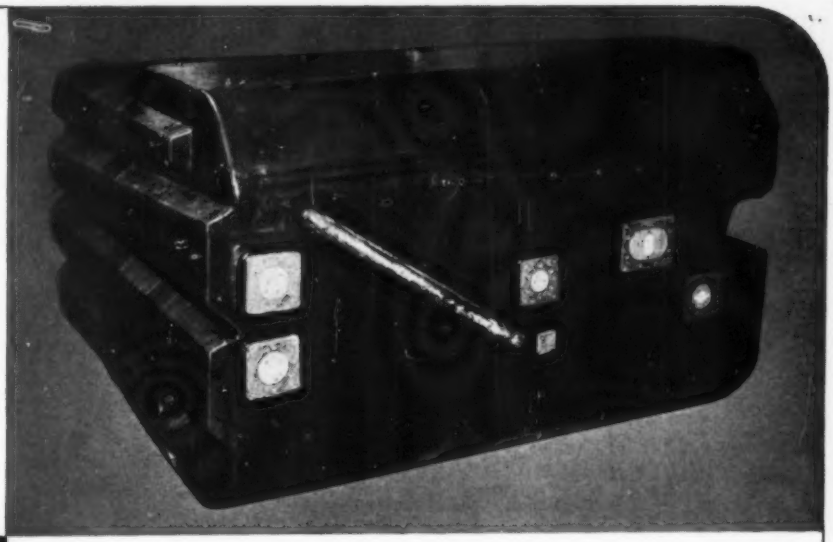

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CAA Approves Allison Turboprop

CAA late last month put its stamp of approval on Allison's Model 501 (military T56) engine paving the way for first use of a U.S.-built turboprop in commercial operation.

T56 currently is the only power plant proposed by Douglas and Lockheed on medium-range turboprop transports for American and Eastern Air Lines.

AA decision on the T56, which would put General Motors' Allison Division in the commercial engine business side-by-side with Curtiss-Wright and Pratt & Whitney, is expected within weeks.

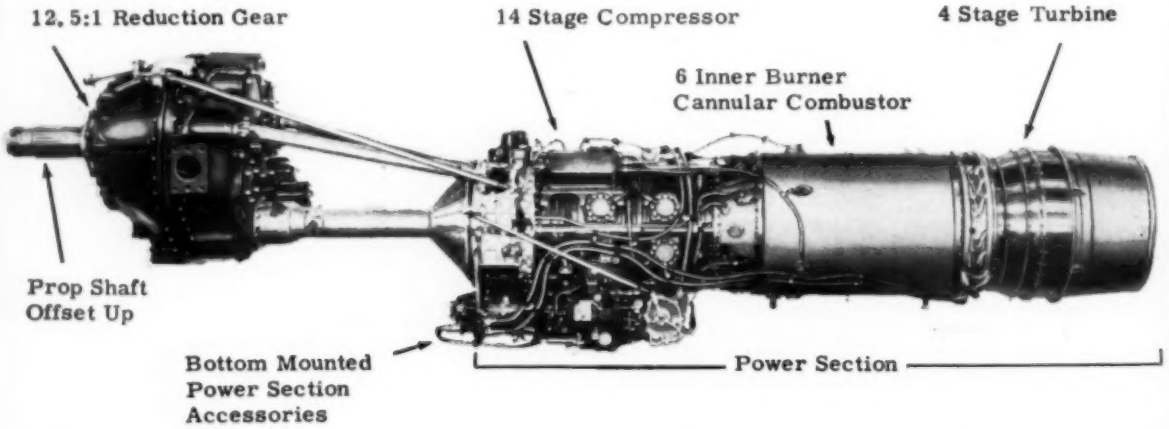
Final CAA approval, covered by Type Certificate No. 282 dated May 20, covers two T56 models, the 501-D10 and -D12. Former is rated at 3,750 equivalent shaft horsepower, while the 501-D12 is a de-rated engine qualified at 3,015 equivalent shaft horsepower.

De-rated engine is based on restriction of take-off turbine inlet temperatures to 1625°F (3,015 eshp), climb to 1515°F (2,505 eshp), and cruise at 72% maximum power to 1395°F (1,940 eshp).

Advantage of de-rated model is Allison's guaranteed overhaul period of 600 hours compared with 400 hours for the 3,750 eshp engine.

Allison officials, commenting on the CAA step, indicated that the company is ready now to provide engines for commercial certification and flight testing.

E. B. Newill, general manager, said the Model 501 will be available for commercial delivery in March 1957 in ample time for first airline use in late 1957 or early 1958.



AF To Speed Fighter, Bomber Production

Last minute developments at press time all point to an Air Force speed-up of B-52 bomber and supersonic fighter production.

Plan for a 35% production step-up of B-52s was disclosed by AF Secretary Harold Talbott during secret sessions with the Senate Armed Services Committee. Special hearing at which Talbott testified was called by Sen. Richard Russell (D-Ga.), ASC chairman, after week-long statements and counter-statements by Defense officials on the relative superiority of U.S. and Russian airpower (see page 24).

Following the session Russell said "Talbott indicates there will be some acceleration of our production." Russell said he personally heartily recommended that manufacturers step up production by going on at least two shifts a day.

He designated the Boeing B-52 and North American F-100 as aircraft most urgently needed. Indications are, however, that the acceleration program will also be applied to the F-101, F-102 and F-104 supersonic fighter and interceptors.

Boeing B-52 speed-up, according to Talbott, will permit the AF to complete replacement of B-36s in its heavy bombardment and strategic reconnaissance wings well ahead of present schedule.

The Air Force had indicated earlier that it expected to have all 11 heavy Strategic Air Command wings equipped sometime after attaining 137-wing strength in July 1957, probably by late 1958.

President Backs CAB In States-Alaska

President Eisenhower has accepted recommendations of the CAB in the States-Alaska case for retention of four-carrier service. Only change by the President upped the duration of new certificates for Alaska Airlines and Pacific Northern Airlines from three to five years.

Final decision calls for:

Northwest Airlines—renewed permanently on Seattle-Anchorage route; renewed for three years from Twin Cities to Edmonton and Anchorage.

Pacific Northern—Portland/Seattle-Anchorage renewed for five years via Ketchikan, Juneau, Yakutat, and Cordova.

Alaska—Portland/Seattle-Fairbanks renewed for five years.

Pan American—holds permanent rights to Fairbanks, but denied request to serve Anchorage.

White House further indicated full agreement with Board's view that a merger between Alaska and Pacific Northern would strengthen States-Alaska transportation and reduce subsidy.

World Airlines 10-Year Traffic Totals 340 Million Passengers

The scheduled airlines of the world carried 324 million passengers in the last 10 years, according to figures compiled jointly by International Civil Aviation Organization and International Air Transport Association.

Accomplishments of the 65 nations and 72 airlines that are their members are recorded in a booklet commemorating the 10th anniversaries of both organizations.

Title of the booklet is "Every Five Seconds," indicating that on average a scheduled takeoff occurs somewhere in the world every five seconds.

During the decade the world airlines flew 180 billion passenger-miles, 4.25 billion cargo ton-miles, and 1.4 billion mail ton-miles. Their aircraft logged 8.5 billion miles in the course of 47 million hours of flying.

• **Compared with** its prewar performance, today's international civil aviation annually carries 23 times as many passengers, flies 36 times as many passenger-miles, 70 times as much cargo transport and 13 times as much mail carriage. It has increased the number of aircraft miles flown per year by 630% and lifts five times as many passengers per flight.

The ICAO-IATA booklet says that a flight through the North Atlantic region is sustained and aided by a network of 75 airports, 442 approach and navigation aids, 115 terminal and area air traffic control services, nine weather ships, and four storm warning centers.

• **Comparing** air transport in 1945 with its status today, the booklet points out that speeds of aircraft have increased, from 170 to 300 mph. The volume of world air traffic annually has risen in that period from 9.63 billion passenger miles to 32 billion.

Fatalities have been cut from 3.53 to 1.32 per 100 million passenger-miles. The increase in frequency of service is pointed up by the fact that there was one airline flight every two hours across the North Atlantic in 1945 against one every 30 minutes today. Finally, the booklet points out that despite continuous inflation, the price of first-class air travel has risen little since 1945, and thus its real cost in terms of 1945 dollars has been cut almost 40%.

Air Force Starts Work On Rocket Test Stand

Air Force has started construction at its Edwards AFB flight test center of a new rocket test stand capable of withstanding a million pounds thrust. Stand is 150 ft. long, has a vertical clearance of the same distance. Completion date is set for 1957. The new facility is expected to be able to test any rocket engine of the foreseeable future.

CAB Sets Sept. 1 For New Mail Rates

A new multi-element service mail rate structure will become effective September 1 for the domestic trunk airlines under a recent Civil Aeronautics Board show cause order.

On "open" rates since April 1, 1954, the carriers will be paid a fixed ton-mile rate for the period through August 31, 1955. Thereafter, service mail pay will be computed on the basis of a line-haul rate of 30.17¢ per ton-mile plus terminal charges per pound which vary with the size of the station involved.

The new structure is estimated to mean $5.3 million less service pay for the industry, which otherwise would have realized approximately $32 million total for a future year.

The CAB order is expected to run into no opposition since the airlines and Post Office agreed beforehand on the structure now proposed.

For the period April 1, 1954, through August 31, 1955, ton-mile rates will range from a low of 35.81¢ for TWA to a high of 86.62¢ for Northeast.

New rates on September 1, will produce an industry average of 38.56¢, according to CAB estimates. The 30.17¢ line-haul rate will apply equally for all carriers.

Terminal charges are set at 3.32¢ per pound for Class A stations; 6.64¢ for Class B; 9.96¢ for Class C; and 33.21¢ for Class D.

Typical of the cities in each of these classes are: Class A—Chicago, Houston, New York, Phoenix, San Francisco, and Syracuse; Class B—Baton Rouge, Chattanooga, Great Falls, Harrisburg, Mobile, Scranton, and Yakima; Class C—Bartlesville, Fort Dodge, Klamath Falls, Pittsfield, Terre Haute, and Texarkana; Class D—Clinton (Ia.), Mankato, Spearfish, The Dalles, and Truth or Consequences.

Caravelle Flies

France's twin-jet Caravelle transport made its first flight May 27, little more than a month after it was rolled out at the SNCASE Toulouse plant. It is powered by a pair of Rolls-Royce Avons.

Rep. Holifield Acts To Stop TACAN Buying

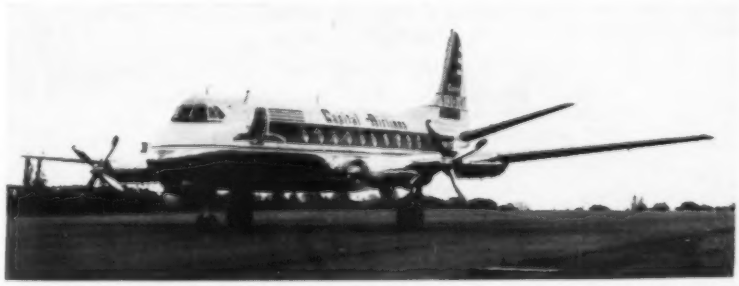
Rep. Chet Holifield (D-Calif.) has asked Congress and the President to take action "necessary in the interest of forestalling" large-scale buying of TACAN navigation equipment.

In one of two resolutions introduced in the House, he supports a Senate-approved resolution calling for a joint congressional inquiry into the TACAN-DME controversy, and in a second urges the President to review functions of the government agencies responsible for development of air navigation facilities. In the latter, Holifield suggests the failure of government agencies to agree on a policy may indicate need for their reorganization.

Obituaries

• **Edward L. (Swanee) Taylor,** 57, veteran barnstormer, aviation writer and emcee of aviation events, at Bethesda (Md.) Naval Hospital.

• **Robert Thach,** 62, former vp and chief counsel Pan American World Airways, at his home, Charleston, S. C.



CAPITAL AIRLINES' first Vickers Viscount shown here made its initial flight last month, and is now being CAA-certificated in England. CAP president J. H. Carmichael returns to England this week and will be aboard delivery flight to Washington on about June 15.

Two Aerojet-General high-thrust, short-duration solid propellant rocket powerplants boost the Navy's famed REGULUS missile off on its mission.

Built by Chance-Vought, the REGULUS is one of a growing number of available missiles for defensive or offensive applications.

This booster was tailor-made for REGULUS. Proven reliability, producibility and low cost make it another example of Aerojet-General's unparalleled experience in development and production of rocket powerplants.

Aerojet-General supplies liquid and solid propellant rocket powerplants, auxiliary power units, gas generators, or other associated equipment to a major part of America's missile program.

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Personal View

By WAYNE W. PARRISH

New Stature For TAC

FOR MANY YEARS now the Strategic Air Command has occupied top place in priority and thinking in U. S. air defense. It is now clear from official utterances of late that the top echelons in the Pentagon now consider that the Tactical Air Command has reached a co-equal status with SAC in importance in military planning and as a deterrent to a major war.

In short, TAC has "arrived" and has already taken its place in the front rank after years of playing a subordinate role. TAC's new and vital position is directly attributable to the Twining team which continues to give a good account of itself since taking over control of USAF several years ago. And no one disputes the high position now occupied by General Otto P. Weyland whose clear thinking and planning has been shoving TAC into the limelight of late. It is an historic and a heartening achievement.

The rise of TAC, however, should in no way dim the lights of SAC. Any diminution of attention to the latter would be tragic. One danger ahead is that the publicity and attention given to the Intercontinental Ballistic Missile may lead Congress and others to feel that SAC's usefulness may be nearing an end. Such an attitude must not be permitted to happen. The good news about TAC is that we now have a second Command fully ready as a deterrent to the launching of a major war and that we are not as completely dependent on only one Commnd as we have been for some years.

Airport Help Needed

THIS IS the time for all those who believe in federal aid for airport construction to voice their beliefs to Congress. The House appropriations committee has recommended $20 million for the next fiscal year, $9 million over this year's miserly total, but not nearly enough for current needs. Senator Mike Monroney (D.-Okla.), and four other Senators have introduced a bill calling for $252 million to be spent over the next four fiscal years at the rate of $60 million per year, and Rep. Oren Harris (D.-Ark.) has introduced an identical bill in the House. These deserve immediate support.

Mayor William B. Hartsfield of Atlanta, chairman of the airport sponsors committee of the American Municipal Association, told a House committee early this month that civil sponsors are ready to provide in fiscal 1956 a full $100 million in local funds to match a like amount of federal funds under provisions of the Airport Act. He pointed out that we have in this country only 150 airports with paved runways 5,000 feet or longer, far under current and future requirements. Thus the Monroney-Harris bills are vitally necessary if airport construction is to move ahead. With Congress getting ready to adjourn early in August there is no time to lose in getting behind the bills calling for more funds that the House appropriation committee has recommended.

It's All Good News

ON MANY varied fronts lately the aviation news reveals healthy trends. Good samples:

William T. Piper has been called the Henry Ford of the civil airplane business many times. Hats off to Piper Aircraft for having delivered its 40,000th aircraft. At current rate a Piper airplane is rolled off the line every fifty minutes. That's progress.

Los Angeles Airways is expanding its passenger-carrying helicopter operations into the metropolitan suburbs, a commendable forward stride in what is destined to be a vast shorthaul market.

The U. S. Bureau of the Budget is taking a long look ahead to determine what the nation's aviation needs will be in the next 20 years. William Barclay Harding has been retained for the job along with some of the industry's best thinkers, and Gordon Bennett has been loaned by the CAA. A very worthy project, much needed.

The local air carriers have now been permanently certificated, an historic milestone in local service. Now that they have achieved a status of reasonable security, we hope they won't sit back and take the security for granted. We don't think they will. The drive to decrease subsidy must continue.

Several local carriers—Allegheny and Mohawk—are launching the use of Martin and Convair equipment. The time has arrived for the locals to put bigger and faster equipment on their better routes. We hope the CAB is as forward-looking as the carriers in this respect, especially in view of the CAB's backward action in slapping Hawaiian Airlines for replacing DC-3s with Convairs on some of its schedules. Equipment replacement should move ahead along with time and traffic needs.

Worth Reading

BRIG. GEN. Dale O. Smith, U. S. A. F., has written a book entitled "U. S. Military Doctrine" which deserves careful reading as the latest thoughtful study and appraisal of a vital subject. Of particular interest are the chapters on the beginnings of air doctrine, and doctrine for the future. How sluggish is the military to change its thinking through the centuries!

"For good or evil," Sir Winston Churchill said in 1949, "air mastery is today's supreme expression of military power, and fleets and armies, however necessary, must accept a subordinate rank." General Smith points the issues clearly, and refers to what one of the great air power exponents, Giulio Douhet, once wrote about waiting before weapons were tested: "Wait for the sanction of experience? That might have a lethal effect on us, for the experience might be gained with us as the object!"

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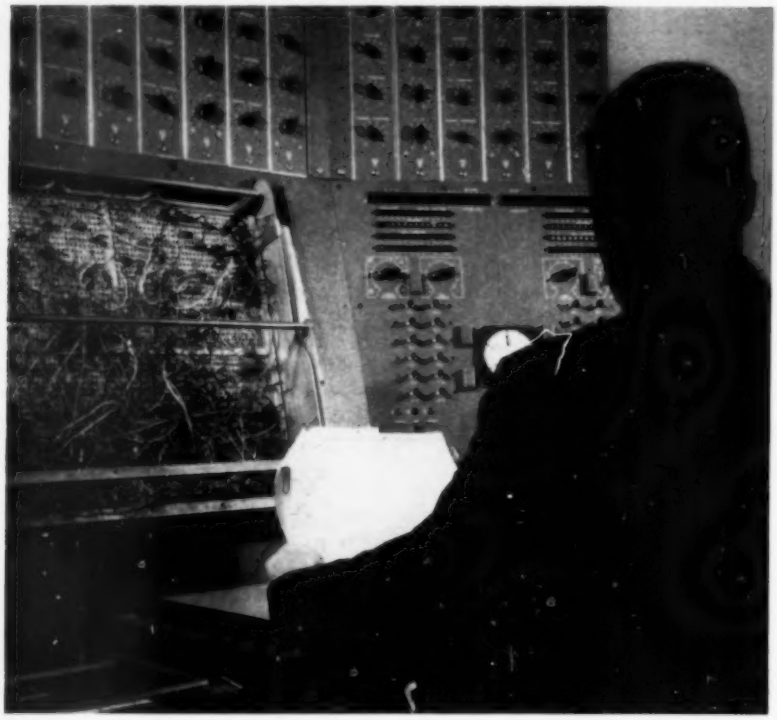

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When & Where

June 9-14—Sixth All-Women's International Air Race, Washington, D. C., to Havana.

June 12-17—Society of Automotive Engineers summer meeting, Viking Theater, Atlantic City.

June 15-17—Air Transport Association airlines operations conference, Williamsburg Inn, Williamsburg, Va.

June 15-17—Air Transport Association airline finance & accounting conference, Miama, Fla.

June 18-25—Third annual Transcontinental Air Cruise, Palm Springs, Calif. to Philadelphia.

June 19-21—American Rocket Society semi-annual meeting, Boston.

June 20-22—University Aviation Association annual meeting, Pennsylvania State University, State College, Pa.

June 20-23—Institute of the Aeronautical Sciences and Royal Aeronautical Society joint meeting, Los Angeles.

June 23-25—Institute of Navigation annual meeting, Maxwell AFB, Alabama.

July 2-6—Ninth annual All-Women's Transcontinental Air Race, Long Beach, Calif. to Springfield, Mass.

Aug. 8-10—Second National Turbine-Powered Air Transportation Meeting (sponsored by the Institute of the Aeronautical Sciences), Seattle.

Aug. 10-14—Air Force Assn. Convention and Airpower Panorama, San Francisco.

Aug. 15-20—National Flying Farmers' Association convention, East Lansing, Mich.

Aug. 22-23—Symposium on Electronics & Automatic Production. Stanford Research Inst., San Francisco.

Sept. 14—Airwork engine forum, sponsored by Pratt & Whitney and Bendix, Millville, N. J.

Sept. 26-27—Automation Symposium, sponsored by Radio-Electronics-Television-Manufacturer's Assoc., University of Pennsylvania, Philadelphia.

Oct. 5-7—National Airports Conference (sponsored by American Association of Airport Executives and the University of Oklahoma, with Civil Aeronautics Administration cooperation), Norman, Okla.

Oct. 5-7—National Business Aircraft Association annual meeting and forum, Sheraton-Cadillac Hotel, Detroit.

Oct. 11-15—Nat'l Assn. of State Aviation Officials annual meeting, Dallas.

Oct. 11-15—Society of Automotive Engineers aeronautic meeting, aircraft production forum and engineers forum, Los Angeles.

Oct. 31-Nov. 1—East Coast Conference on Aeronautical and Navigational Electronics, sponsored by I.R.E., Baltimore, Maryland.

Oct. 31-Nov. 2—Society of Automotive Engineers transportation meeting, St. Louis.

INTERNATIONAL

June 10-20—International Aircraft Show, Paris.

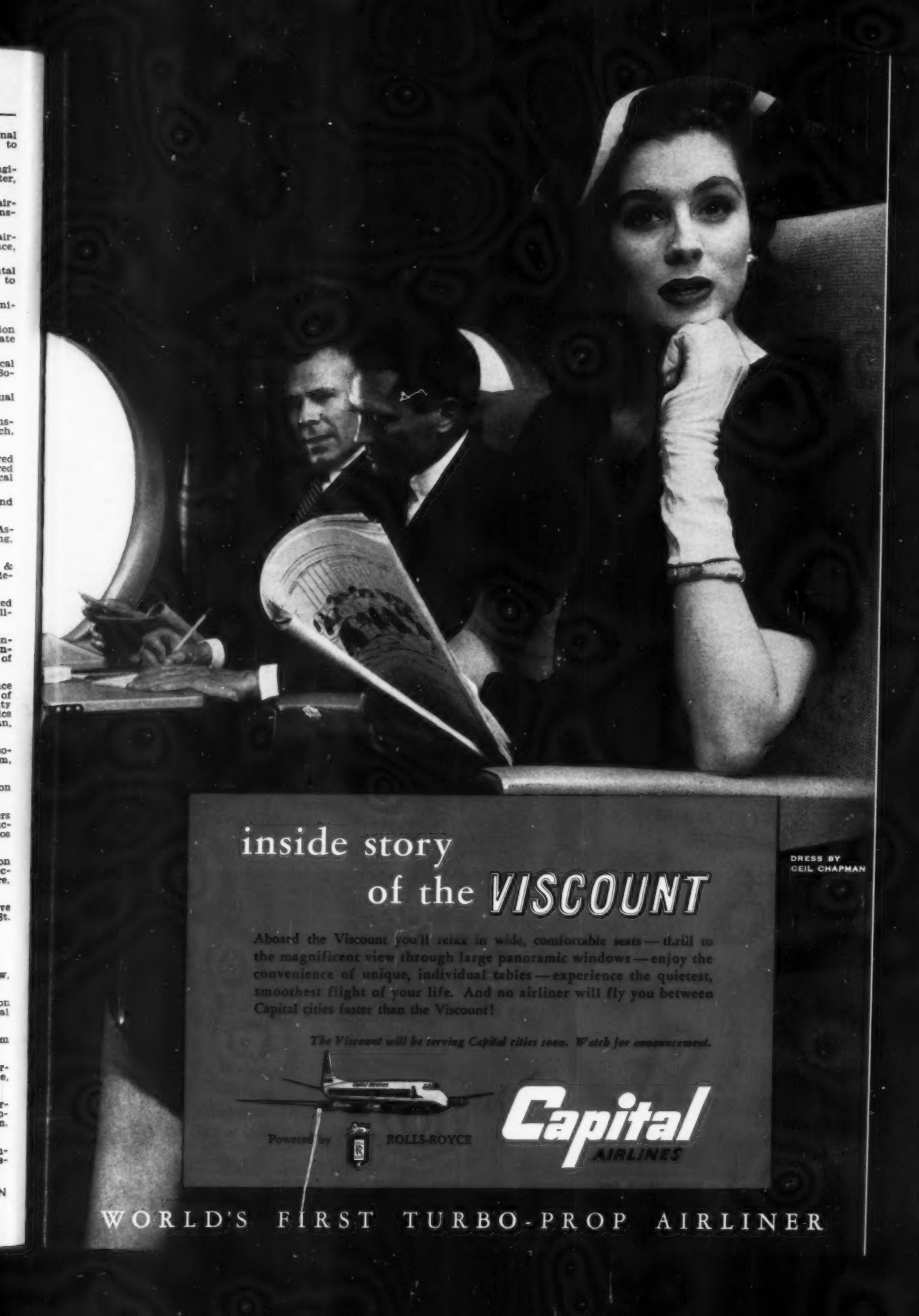
June 15—FITAP (International Federation of Independent Air Transport) general assembly, Paris.

July 27-29—Helicopter Congress, Rotterdam Helicopter Syndicate, Rotterdam.

Aug. 30—International Civil Aviation Organization air navigation conference, Montreal.

Sept. 6—International Civil Aviation Organization conference on draft protocol to amend Warsaw convention. The Hague.

Sept. 6-11—Society of British Aircraft Constructors Aircraft Show & Flying Display, Farnborough, England.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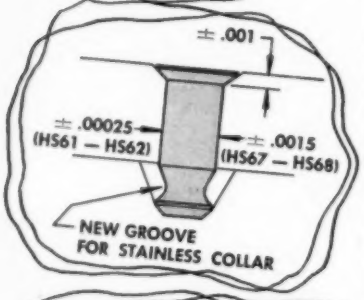

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Production Spotlight

• A Bristol Orpheus has completed a 150-hour type test at 3285 pounds rating; others are already running at higher thrusts. The Orpheus' thrust-weight ratio of 4.4 is higher than that of any other type-tested turbojet.

• The Martin P6M Sea Master will be capable of carrying a 30,000-pound warload at over 600 mph.

• Latest version of France's SNECMA reverse thrust device can enable a four-ton aircraft to be stopped in 900 feet after landing, against 2500 feet using brakes only.

• The first North American F-86K assembled by Fiat in Italy has flown, piloted by A. R. DeBolt of the U. S. company's flight test staff.

• A French Air Force contract for the Breguet Deux Ponts is imminent. The initial order for the big four-engine transport will be for about 15 planes.

• Bendix International Division is staging a major sales campaign in Europe for SPAR (Super Precision Approach Radar) developed by Laboratory for Electronics, Inc. of Boston. Equipment can be operated by one man and is priced in the $35,000 class, far below full GCA installation.

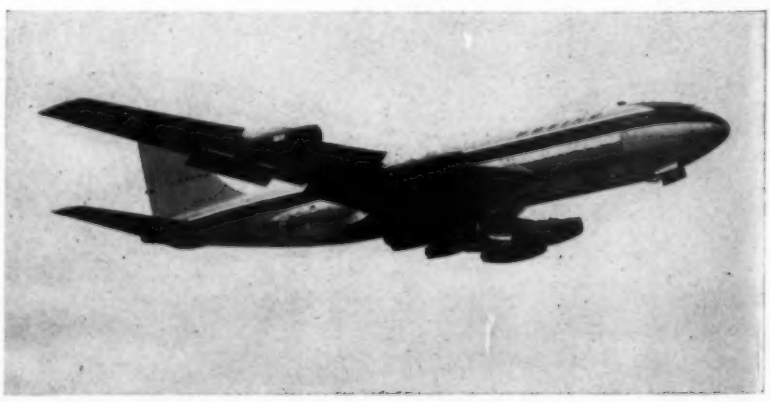
• Most talked about feature of Douglas Aircraft Co.'s DC-8 jet transport mock-up is a main cabin door design that gives the safety of an inward opening door but still opens outward. Douglas door has top and bottom sections that butt against structure from the inside to prevent inadvertent opening in flight. When the door handle is operated the sections fold "accordion style" clear of the structure to permit outward opening. Double articulated hinges permit easy movement of the door past side structure that would otherwise prevent it from opening outward.

• Marquardt Aircraft Co.'s management has decided not to pursue merger negotiations with United Aircraft Corp. President Roy E. Marquardt, disclosed that United Aircraft had initiated informal discussion in this direction, but that no actual negotiations have taken place.

• First flight of Lockheed L-1649A Superconstellation is slated for September, 1956 with production deliveries to follow in the spring of 1957. Three aircraft will be used for CAA certification program which will last about eight months.

• Strongest prospects as next 1649A customers are Air France and Lufthansa, with Air France negotiating for twelve aircraft and the latter considering purchase of four. Lockheed is also proposing early warning and command versions for the military using either turboprops or Turbo Compound engines. Navy, it is reported, still leans toward piston engines because of 20-30,000 ft. normal operating altitude for these EW aircraft.

• Convair-San Diego is working out details of modified 240/340 versions using auxiliary tip jets that would raise cruise speed to 365 mph and gross to 54,000 pounds. Engines would be Fairchild J44s or Continental J69s. Modification would include addition of 500-gallon fuel tankage in outer wing panels.



BOEING'S 707 JET tanker-transport prototype made its 100th test flight last month at Boeing Field, Seattle, with A. M. (Tex) Johnston, who took the plane up on its initial flight, at the controls. The 707 has logged more than 150 hours flight time.

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The F101A *Voodoo,* built by McDonnell Aircraft Corporation, for service in the Strategic Air Command, is believed to be the world's most powerful fighter airplane . . . supersonic . . . long-range . . . capable of in-flight refueling and carrying atomic weapons!

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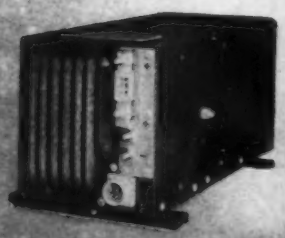

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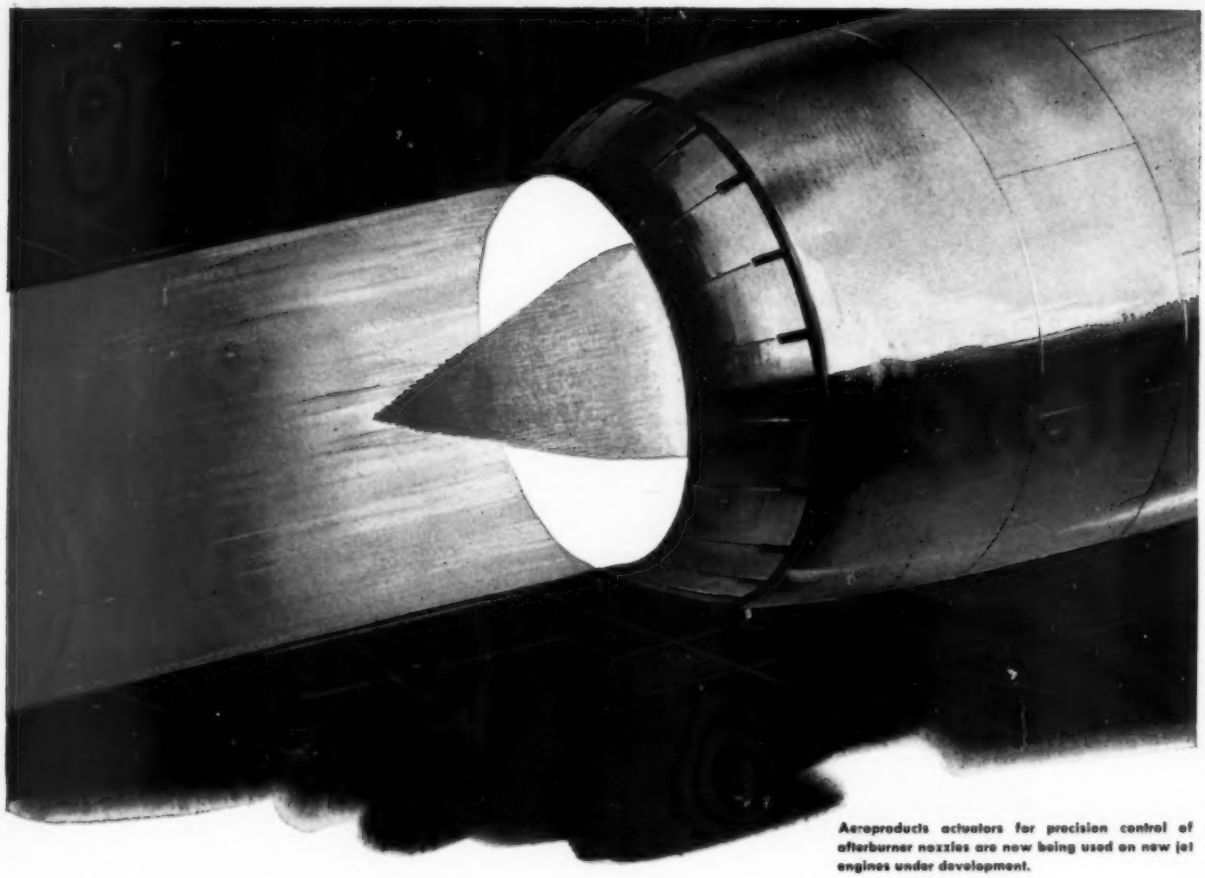

Aeroproducts actuators for precision control of afterburner nozzles are now being used on new jet engines under development.

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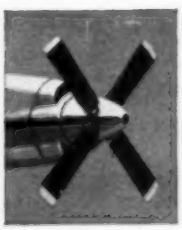

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AIR-DRIVEN HYDRAULIC PUMP

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Now, Aeroproducts mechanically synchronized hydraulic actuators assure precise positioning among the multiple attaching points of the afterburner nozzle.

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These actuators, in both hydraulic and pneumatic versions, are applicable to all high-ambient temperature installations, including jet engine thrust reversers, flaps, and split-control surfaces on guided missiles.

If you're on a team designing a new airplane or powerplant, you'll find Aeroproducts ready to meet your most detailed specifications—for turbo-propellers, other propellers requiring high horsepower absorption, actuators, air-driven generators and hydraulic pumps, and other aircraft components now in the development stage.

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AIRTRENDS

Washington, D. C., June 6, 1955.

AIR FORCE OFFICIALS WERE DUE late last week to re-appear before Senate Defense Appropriation subcommittee to seek added funds for aircraft procurement. Scope of new requests, now virtually assured of Congress' sanction in the light of Russian advances, is placed by reliable sources at $300,000,000.

Almost simultaneously, Senate Armed Services Committee called a special meeting to determine steps to be taken by its Capitol Preparedness subcommittee in the controversy over U. S.-Soviet air supremacy.

RECENT RUSSIAN AIRCRAFT DISPLAYS will do more than spark accelerated production of newest U.S. fighters and bombers. Intensified development of improved Nike and Bomarc missiles for air defense, and the Atlas intercontinental ballistic missile, can be expected as well. Reports indicate a much-improved Nike II missile is well under way.

Pentagon also will soon begin a drive to encourage better use of engineering talent by contractors. In the face of Russian superiority in numbers. Defense Department will move to balance the scales on the basis that too many engineers are now doing work which could be handled by less highly skilled personnel.

AN ENTIRELY NEW LIGHT HAS BEEN CAST upon current debate over U. S.-Russian air superiority by Hoover Commission's report last week on research and development in the Government. Commission charges that Armed Services are not sufficiently "daring and imaginative" in their approach to radically new weapons systems. As a result, even step-up R&D programs may be too late to maintain U. S. supremacy.

Hoover group told Congress that Defense Department organization provides inadequate framework for initiating new approaches in weapons. Most advances, it found, have resulted from "informal proddings" by civilian scientists and technologists.

Five-point plan of action is proposed to remedy the situation. It calls for: (1) increased integration of Defense R&D programs; (2) better personnel policies designed to keep military and civilian experts on the job; (3) increased attention to basic research; (4) more effective use of the Nation's scientific and technical communities and private research facilities; and, (5) an overall strengthening of the quantity and quality of work in this area.

ONLY MAJOR REORGANIZATION SUGGESTED would consolidate Defense R&D and applications engineering functions at the assistant secretary level. The Commission lauded Air Force's well-integrated organizational structure as opposed to "compartmentalization" of Army and Navy R&D programs. USAF R&D Command headquarters, it said, has outgrown available facilities in Baltimore and should be provided with permanent facilities promptly.

INDUSTRY UPRISING OVER PENTAGON dispersal policy appears to have subsided. More detailed explanations by top Defense Department officials of the scope of their planning apparently satisfied most contractors.

LOOK FOR A CHANGE IN DESIGN concept on supersonic fighters and interceptors toward fuselage-mounted external fuel tanks instead of the former wingtip arrangement. Reason is that newer thin-wing models can't support tiptanks.

Good example is McDonnell's F-101 Voodoo, now classed as the heaviest and longest range fighter-interceptor on U.S. production lines. F-101 can mount three jettisonable fuselage tanks giving it the versatility of a convoy fighter for the B-52 on long missions, a long-range interceptor or reconnaissance aircraft, or a regular fighter.

Letters

Facing the Facts

To the Editor:

I am writing in regard to your editorial "Facing the Facts": in the May 9 issue. I have no way of knowing what reaction this piece was *intended* to provoke, but I do know my own reaction was surprise and disappointment, and this has been expressed independently by many, many of your readers with whom I have spoken. The general feeling is a complete inability to understand the attitude expressed in your editorial in the light of previous factual and knowledgeable reporting of the VOR/DME-TACAN issue in your magazine and in the Daily.

The issue in controversy is *not* merely a technical comparison of two techniques of generating and measuring radio navigation information. No person or agency who took issue with the ANDB Report of February 8 can logically be said to oppose technical progress; aircraft users know full well that "the price of technical progress comes high," for they are progressing with improved radio navigation aids to new utility in air transportation.

Aircraft users know, too, the chaos of *unplanned* progress in radio navigation. They learned the hard way that efforts to progress in more than one direction, no matter how diligent, were foredoomed to failure.

So it is, this validity of planning and authority of agreement that emerges as the core of the VOR/DME-TACAN issue. Civil aviation has a right to expect reasonably long-term stability from the navigation systems which they were a party in planning. And the measure of satisfaction with any step in technical progress is the ability of the users to (a) participate in evaluation and acceptance of a proposed succeeding system; and (b) adjust to a transition to such acceptable succeeding system at reasonable financial sacrifice, but without sacrifice of safety or convenience.

Now look at VOR/DME-TACAN from the point of view of your confused reader. He has become aware over recent months that this sacred common system he thought was a pretty good thing is under threat of being superseded while still a-borning. Having a high regard for the interpretive judgment of AMERICAN AVIATION, he eagerly awaits your reporting, and is pleased with the accurate review by Joe Murphy in your February 28 issue. He is heartened, too, that his interests are apparently being defended, and he seconds your editorial criticism of the military in "Take Off The Wraps."

Then, after weeks of hearings and protests duly reported in his favorite trade press, this reader learns that a "compromise" has been achieved in something called the Air Coordinating Committee. He has understandable doubts that this compromise leaves his beloved common system inviolate, but he appreciates that it is at least an instrument which earned the unanimous agreement of the Executive Branch of the Government. Your reader feels that somehow, this situation is more hopeful now that the two Government Agencies involved are no longer fighting with each other.

He recognizes this as an essential first step in a return to badly needed order and stability.

Then he turns to your "Facing The Facts" to learn that this ACC agreement is only a "futile gesture," and that his champion of the Aviation Trade Press has moved right before his very eyes from "Take Off The Wraps" through "if," to "presumably . . . TACAN" and finds to his amazed dismay that "the unswerving trend is toward TACAN."

Let's face the facts, Mr. Parrish. What is TACAN?

G. F. QUINBY
Sales Manager
National Aeronautical Corporation
Ambler, Pennsylvania

'Men and Ideas'

To the Editor:

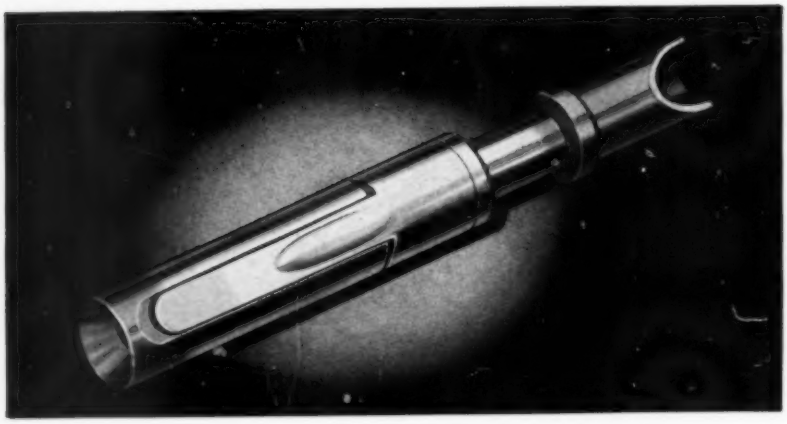
I congratulate you and your staff for "Men and Ideas" in AMERICAN AVIATION, March 28. If this is the start of a series, keep going and good luck. Such Americana is fine reading and it both inspires and encourages all along the line.

Vernon H. Van Diver
Woolford, Md.

To The Editor:

We all enjoyed the story about Mr. Perelle in your March 28 issue.

Julia McAuly
Carle Place, L. I.



"CLIP-TYPE" closed entry socket contact now standard in

BENDIX-SCINFLEX ELECTRICAL CONNECTORS

Cannot be overstressed—eliminates intermittent circuit problems resulting from socket contact malfunction.

The heart of any electrical connector is the socket contact. This is why the Bendix-Scinflex* socket contacts have always been machined from bar stock. Stampings, with their required thin sections, can be easily overstressed.

Even with the machined sockets, industry has been plagued with overstressed spring leaves due principally to the misuse of test probes and lax tolerances on pin contacts. Bendix engineers have now provided the only socket contact on the market today which completely eliminates all these problems.

The "Clip-Type" socket will not accept any oversize probe or pin, nor can one be forced into it. Also, no amount of wrenching or twisting of an acceptable pin or probe can possibly distort the spring clip. This new socket is now standard in all Scinflex connectors including those using solderless, high-temperature and thermocouple contacts.

Our sales department will be glad to furnish complete information on request.

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Pulse of the Industry

How Plane, Parts Producers Fared 1950-1954

During the five years, 1950-1954, 16 major aircraft and parts manufacturers increased their fixed assets at cost from $373.2 million to $677.7 million, a gain of 81.6%, an AMERICAN AVIATION survey shows.

For the same period, reserves for depreciation of these firms went from $199.1 million to $329.4 million, an increase of 65.4%.

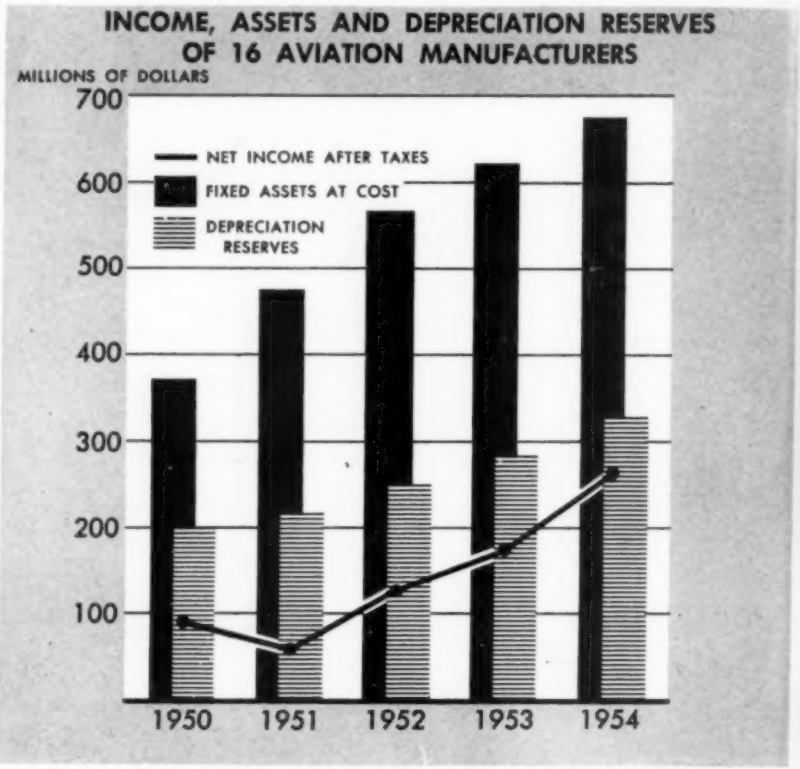
Book value (the difference between fixed assets at cost and reserves for depreciation) went from $174.1 million to $348.3 million, an increase of 100.1%. The firms under consideration purchased $101.3 million worth of fixed assets in 1951. Since then, the purchase of fixed assets has been: 1952, $98.2 million; 1953, $51.1 million; 1954, $56.3 million.

Last year brought the end of purchasing fixed assets at a decreasing rate. Even though United Aircraft didn't have the largest income after taxes in 1954—Boeing and Douglas made more than $36 million to UAC's $26 million—this company continued to spread eagle the field both in fixed assets and depreciation reserves. In 1954, United became the first of these firms to have more than $150 million in fixed assets and more than $80 million in depreciation reserves.

$269.6—Million Income

Net income after taxes for the 16 firms was $269.6 million in 1954; $177.3 million in 1953; $129.2 million, 1952; $65.4 million, 1951 (the 1951 figure includes a $22.2-million loss of Martin; actual net income was $87.6 million), and $97.3 million in 1950.

It is interesting to note that the National City Bank of New York, in a similar study, tabulated the net income after taxes of 38 aircraft and parts manufacturers and reported a net income after taxes of $272.0 million for 1954 and $176.3 million for 1953. These figures are comparable to the ones reported above, as are those of percentage change in net income comparing 1954 with 1953: 54% according to the National City Bank and 52.1% based on this study.



Rank of 16 Leading Firms

(Based on 5-Yr. Average)

Net Income After Taxes—In Terms of Percent

Company	5-Yr. Average	1954	1953	1952	1951	1950
United Aircraft	12.50	9.65	11.95	13.72	16.29	13.56
Boeing	12.08	13.71	11.46	10.85	8.15	11.12
Bendix	11.76	9.47	9.79	11.78	13.49	17.41
Douglas	10.77	13.41	10.48	8.31	7.89	7.41
General Dynamics	8.62	7.71	7.44	10.86	10.06	7.06
Lockheed	8.11	8.32	8.72	6.98	6.62	7.40
North American	7.74	8.23	7.18	6.02	7.33	8.30
Curtiss-Wright	7.30	7.18	6.43	6.97	7.89	7.47
Grumman	4.79	4.16	4.02	4.12	6.23	6.41
Republic	4.15	3.33	4.69	6.24	3.35	2.42
Martin	2.96	7.44	8.51	4.47	—[1]	3.21
McDonnell	2.30	1.34	2.39	2.36	3.76	2.89
Fairchild	2.25	1.53	2.26	2.43	2.54	3.18
Bell	2.21	2.37	1.95	2.34	2.20	1.51
Northrop	1.74	1.42	1.90	1.87	3.74	—[2]
Ryan	0.72	0.73	0.83	0.68	0.46	0.65
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

[1] *$22.2 million net loss*

[2] *$45,000 net loss*

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CANADA'S CONTRIBUTION
TO THE DEFENCE OF EUROPE
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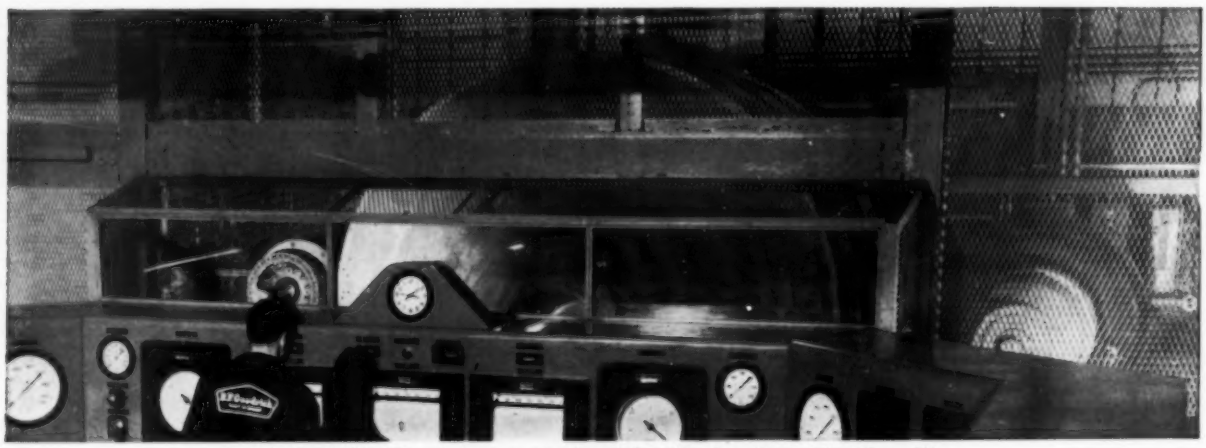
RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

World's first 300 mph tire dynamometer, located at B. F. Goodrich's Akron, Ohio plant.



B. F. Goodrich's 250 mph dynamometer installed at Wheel and Brake Plant, Troy, Ohio.

B. F. Goodrich lands plane indoors so you can land it better outdoors

THE DYNAMOMETERS above give B. F. Goodrich tires, wheels and brakes the toughest tests they can get. They simulate landings at speeds up to 250 and 300 mph.

At top right you see a new B. F. Goodrich airplane Tubeless Tire as it slams against the dynamometer's whirling flywheel under 10,000 lbs. load. Instantly it develops 4,000 rpm—a combination of impact, friction and centrifugal force that will disintegrate an ordinary tire. What happens? After 16 landings—far more than required—the new B. F. Goodrich Tubeless Tire is still good for more. Result: the world's only 300 mph Tubeless Airplane Tire is now ready for the Navy.

In the lower photograph, B. F. Goodrich wheels and brakes for a modern jet bomber are going through a refused take-off test. The brake dynamometer road wheel stores the energy developed by the rotating mass. At the proper moment, the wheel, tire and brake assembly is "landed" at the bomber's take-off speed—and under a load equal to the bomber's weight which is over 50,000 lbs. per wheel.

Suddenly, the brakes are applied. They have to stop the dynamometer wheel and absorb all the energy in a matter of seconds. The single wheel and dual brake combination must absorb more than 30,000,000 ft-lbs. of kinetic energy—as much force as is generated by stopping approximately 65 automobiles going 60 mph—but the B. F. Goodrich brakes bring the plane to a standstill in the specified landing time which assures a safe stopping distance. The wheel is undamaged.

How do you benefit? We can give you faster delivery by speeding up qualification of our tires, wheels and brakes to your specifications. And we give you better landing assemblies because we can quickly confirm new engineering and design ideas. With our unmatched testing and research facilities, we're looking forward to helping you solve more of your landing and take-off problems. *The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

ESTABLISHED JUNE 1, 1937

World's Largest Aviation Publishers
American Aviation

VOL. 19, NO. 1

RED AVIATION PROGRESS CHALLENGES U.S. AIRPOWER SUPREMACY

AMERICAN AVIATION's intelligence sources make it clear that:

● Soviet has trained its own aviation technicians to standards comparable with those of their western counterparts.

● Soviet research and development work has been highly efficient in exploiting and improving captured German designs.

● In the past 10 years the Soviet has become independent in most fields of aeronautical engineering—it no longer has to lean on stolen or copied western designs produced with the assistance of western technicians.

● Simplicity of Soviet designs and the full utilization of the mass production potential make it possible for the Russian aircraft industry to approach the capacity of the U. S.

By Anthony Vandyk

THE RUSSIAN aircraft industry is fast approaching the qualitative standards of its U. S. counterpart, according to an American Aviation intelligence report on the status of aviation research and production in the Soviet Union. The report, which comes from a source of high reliability, serves as a new warning that it is time for the Soviet aviation potential to be seen in a new light.

Today Russia has a highly efficient aircraft industry backed by a comprehensive research organization. Working methods are not as modern as in the U. S. but bear comparison with those employed in Western Europe.

Manual assembly line work still is current in all plants of the airplane industry, although there are some mechanical lines. Some plants are beginning to introduce fully automated production and assembly. The work at the most important plants deviates completely from usual Soviet practice.

Contrary to general custom, the workers there are not required to fulfill certain norms or to do piece-work, and there are no daily quotas to be met. They must only see to it that a certain monthly standard figure is reached.

• **This trick of labor** psychology seems to have been quite successful. It is difficult to say, however, to what extent this policy was forced upon the Soviet planners by the occasional fluctuations in the supplies of material. The aircraft industry, incidentally, is least affected by such difficulties, because it has priority on all the material it requires.

In many plants the precision of parts leaves much to be desired. Occasionally there are stoppages at airframe plants because planes just finished crash right after taking off, due to serious material defects. The pathological fear of sabotage in Russia results often in an entire weekly production being checked meticulously, with the whole plant turned upside down.

A decided success was achieved when a large number of heavy presses was put into operation. Two German Wotan presses with a capacity of approximately 15,000 tons each have been in use for years. The opinions of experts vary as to the number of presses built and put into operation in the meantime. In any case, at least six are in use at Moscow, Komsomolsk, Tomsk and Kiev.

• **Two years ago** it was planned to utilize 30 presses. They were to be assembled at the plants already named and at Leningrad, Kuibyshev I (formerly Samara), Irkutsk, Krasnoyarsk, Voroshilov and Khabarovsk. Two years ago the Russians made an official statement that they had a 60,000-ton press under construction.

The turning point for Soviet aviation came last year when the Russians returned to Germany large numbers of top aviation technicians who had been working for them since the end of the war. Among those who returned were Professor Bock, aerodynamic specialist of the German Institute of Aviation Research; Professor Brunolf C. Baade, formerly Junkers' chief designer, and Siegfried Gunter, formerly Heinkel's chief designer. They had been at Podberesye near Kimry.

Baade is now in the Soviet zone of Germany and lectures on metal plane design at the Dresden Technical Institute. The other two are in Western Germany.

• **The majority** of about 200 German V-2 experts from the Peenemunde guided missile center also have returned after a period of a year and a half of inactivity and isolation on an

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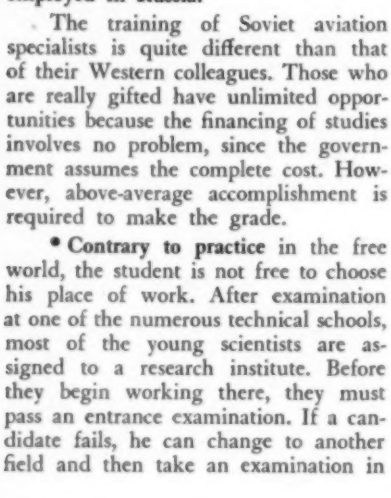
island. Other aviation technicians have been confined for months at a camp called Ilinskaya near Moscow for brainwashing. Some of them have already returned, but others are still waiting. Since it seems highly unlikely that the Russians have further work for these top experts, the only conclusion that can be drawn is that the Soviet Union is now self-sufficient.

This conclusion is substantiated by the fact that **Russian** aviation specialists "on loan" now are giving lectures on jet design to students in Eastern Germany.

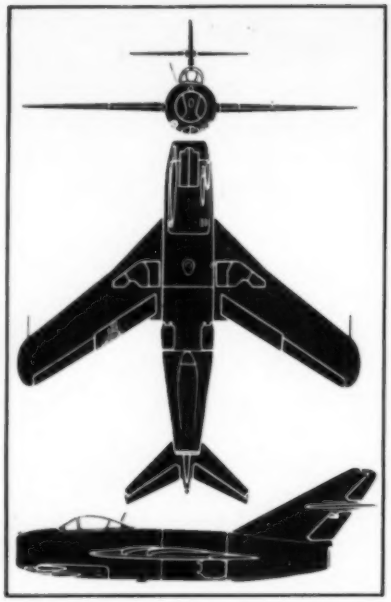
Among the few Germans still known to be working in the Soviet Union is a numerically small but important group of radar experts and guidance system specialists. (For example, former employes of Lorenz, Telefunken and Braun-Radio are still working near Moscow.) Some individual German specialists in the fields of aircraft hydraulic systems, high-altitude research and cosmic radiation are still employed in Russia.

The training of Soviet aviation specialists is quite different than that of their Western colleagues. Those who are really gifted have unlimited opportunities because the financing of studies involves no problem, since the government assumes the complete cost. However, above-average accomplishment is required to make the grade.

• **Contrary to practice** in the free world, the student is not free to choose his place of work. After examination at one of the numerous technical schools, most of the young scientists are assigned to a research institute. Before they begin working there, they must pass an entrance examination. If a candidate fails, he can change to another field and then take an examination in this new field. He cannot repeat the former examination, and if he fails the latter he is barred from scientific technical work.



COUNTERPART of the USAF's B-47, the Badger is in production. It has a maximum range of about 4,500 miles.



THE MiG-17 Fresco fighter has a top speed of 750 mph. It is replacing MiG-15 in combat units. Armament comprises one 37-mm and two 20-mm guns.

Students at all Soviet universities and technical schools must work hard, since they do not always have available the high standards of instruction and facilities to which western students are accustomed.

The fact that most Russians are excellent mathematicians in both theoretical and practical work helps to make them good aerodynamicists. Strangely enough, however, Soviet research does not greatly stress the evaluation of results provided by theoretical calculations of aircraft and powerplant performance. This is especially noticeable in the development of airframes.

Foreign products are evaluated with special care, and the Russians do not spare the trouble of making full-size copies of foreign models so as to obtain an exact picture of the possible performance of certain designs.

The evaluation of the results of western research, especially in the field of aviation, is centralized to a high degree. There is hardly a specialized periodical or report on research in the free world that does not reach the hands of the centralized evaluation authorities and is passed on from there to the experts concerned.

Short summaries of the contents are made in Russian of all articles which appear to be of interest. These summaries are distributed to the corresponding authorities and institutes. A full translation is made when an office believes it might be useful.

Until a few weeks ago the notorious MVD was in charge of obtaining foreign reports on research and experience. Pursuant to the curtailment of the authority of the MVD since Beria's fall, a new control authority for security tasks, called the KGB (Committee for State Security) was established.

• **This new organization** recently took over the gathering of all information on transportation, including aviation, in the western countries. This evaluation is carried out not only in the Soviet Union itself, but in Eastern Germany and the other satellite countries as well. For example, there is a foreign aircraft industry section within the Volkspolizei Luft (East German people's aviation police) which subscribes to several copies of all available publications and screens them.

The coordination of scientific work is done by well-known centralized institutes (ZAGI, VAIM, the Institute for Aircraft Armament, Fuels and Lubricants, for Research on Material, and the Arctic Institute). New aircraft designs are not built as prototypes until they are approved by the Central Design Bureau (ZKB).

Research and Development

Aircraft development no longer is being carried out at only one or a few places. Many aircraft plants now have facilities for development, but the final decision is still made by one authority. The so-called "OKBs" (special offices for design work") are a typical Soviet institution. Scientists and designers are forced to work there virtually as prisoners.

THE BISON FOUR-JET bomber has a top speed of about 560 mph and carries a maximum bomb load of over 4,000 lbs. Maximum range is about 4,400 miles.

Professor A. N. Tupolev, a major-general, was forced to work in such an OKB for years (until 1942 or 1943). There he developed his twin-engine light Tu-2 bomber which was used successfully. That meant his return to freedom. After 1945, mainly German scientists and designers worked in OKBs.

The centralized research institutes have their main offices in Moscow, but branch facilities have been established in recent years, mostly in Siberia. Besides a military aviation academy, Moscow has two aviation institutes—the **Institute for Aviation Technology,** 31-33 Borby Square, and the **Sergei Ordzhonikidze Institute,** 1 Karl Marx Street, Kazan, Tatar Republic. The **Institute for Aviation Instruments and Equipment at** 74 Moskovskoye Avenue, Leningrad, is of greater importance.

The Ukraine has an important research center, the **Institute of the Ukranian Republic,** at Pomerki 27, Kharkov. South of the Ural Mountains, the Bashkir Republic has a central institute for aviation at 61 Lenin Street, Ufa. Another institute has been established at Irkutsk.

The **Academy for Aviation Industry,** created toward the end of 1947, occupies a special position. It trains engineers for the plants administered by the Ministry for the Aviation Industry (MAP). Aircraft engineers and foremen with at least five to seven years of practical experience are trained here in two-year courses.

• **The Russian Wright Field** at Ramenskoye near Moscow has long ceased to be the only flight testing center. New testing centers have been built at Khabarovsk on the Amur and at Voronezh, for example. A new airfield for testing purposes has been in use near Takutsk since the latter part of 1954. During the war the only large windtunnels were in use at the ZAGI Institute in Moscow. Now there are also supersonic windtunnels at Voronezh, Khabarovsk and other sites.

An institute for research on rocket fuels at Khimki and a guidance systems center have been established; the latter is located on Leningrad Avenue, Moscow. In view of the increasing importance of the radar industry, the Supreme Soviet created a new ministry for the radio technical industry on April 27, 1954. It is headed by Valeriy Dmitriyevich Kalmykov.

Soviet Electronics

Even though considerable improvements have been made in the production of radar equipment, this field remains one of the weakest points in Soviet research. There still is a shortage of tubes, even though they are obtained in large quantities from the Soviet zone of Germany and to some extent from Switzerland.

The new MiG-17 (Fresco) fighters are equipped with new radar sets which have twice the range of the equipment used in the MiG-15. The naval air force, which generally does not have the most modern equipment, for some time has had radar sets developed from the German "Berlin" and "SN-Z" search equipment. Moreover, since 1951 the Soviet Air Force has been using a radar set which makes possible the guidance or detection of aircraft within a range of up to 100 miles. This radar is said to be blind only under about 100 feet and at a range of perhaps 30 miles.

• **Nevertheless,** the extent to which the Russians are dependent in this respect on supplies from outside the country is evident from the fact that numerous specialized East German firms are working almost exclusively for the Russians.

The former Nitsche plant at Leipzig, now called VVB Optik, produces curve potentiometers for aircraft. The famous Carl-Zeiss plants at Jena manufacture theodolites with high performance and also position finders. This factory and the Askania plant at Teltow that supplies parts for windtunnels, balancing devices and precision instruments are regarded by the Russians as S-5 plants—vital factories with top priority.

A leading Soviet physicist who recently fled to the U. S. declared that the Soviet Union now is in a leading position with regard to the development and production of transistors. German specialists in this field still are working in the Soviet Union. Eastern German economists estimate that in 1954 the industry of the zone furnished approximately 65% to 75% of all Soviet radar equipment and of many other precision instruments.

However, these percentages apply not so much to production as a whole but to certain types of tubes and equipment. The main centers for electronics research are located at Moscow and Leningrad and both are about equally important. The former German "Wurzburg" and "Morgenstern" radar sets were improved there, and the new types became ready for mass production more than a year ago.

Engine Development

The central institute for research on materials (VAIM) has its main laboratory at Moscow. A branch laboratory has existed for some time at Khabarovsk. It is known that priority is given there to the study of titanium and its alloys. It is known too that the research on alloys for turbine blades has long since reached the stage which had allowed Britain to lead in this field.

The main aircraft engine research facility (ZIAM) has been located in Moscow since the 1930s, but its status no longer is what it used to be. Engines, especially reciprocating units, are still developed there to a major extent but there now are important branch laboratories elsewhere.

• **The development** of modern jet power units is assigned to the Central Engine Research Office (ZARB) No. 128 at Krasnogorsk near Moscow. Many experts are unanimous in their opinion that the organization of development work and the production methods themselves are good. This fact first became evident when the MiG-15, with its copy of the Rolls-Royce Nene turbojet powerplant (imitated in less than a year), came out in ever increasing numbers.

The mass production of the RD-45 (M-45, improved Nene) in the plants at Magadan, Khabarovsk, Ufa and Kiev is being cut down at present. This is true also of the improved VK-1 and VK-2 jets which also are used in various MiG-15 series. For some time more powerful jets have been mass-produced for this purpose. As long ago as 1948, the Mikulin Mik-205 exceeded the performance of the Nene, but it was not then ready for mass production.

The new Mik-209 develops 14,000 pounds thrust with afterburning and 10,500 pounds without. Some 1,500 of these engines have already been produced at Voroshilov, Kiev and Irkutsk.

What were matters of conjecture a few years ago—that the Soviet had improved versions of the German M-012 and M-018—now are in mass production. The 9,500-lb.-thrust M-012 is being produced at Komsomolsk, Moscow and Tashkent; on May 1, 1953, it went into mass production at Magnitogorsk and probably Vladivostok. This jet is used in the Ilyushin Il-28 light bombers, the Tupolev Tu-7 (Type 35 Bosun) and a twin-engine night fighter model.

The "Super-MiG" has flown in prototype form with an M-018 powerplant of 12,500 lbs. thrust. The M-018 is produced at Plant No. 19 in Molotov, at Sverdlovsk and Moscow.

• **Soviet rocket motors** are basically improved German units. The BMW-718 rocket motor which formerly gave about 2,400 pounds thrust is now in production at a rating of 3,800 pounds. It is designed for two different liquid fuels, one consisting of oxygen and alcohol and the other of kerosene and an unknown admixture. Developments of the Walter rocket motors are also in production. The HWK-509 rocket motor has been developed so as to give some 5,700 pounds thrust in its production

Other Red Developments

It is known that new types of aircraft bombs (not atomic bombs) are being tested by the Russians. Bombs weighing of 1,100 lbs. have been dropped on ranges east of the Caspian Sea. The explosive effect of the bombs was devastating. It is likely that they are improvements of the so-called compressed-air bombs used experimentally by the Germans during the Second World War at Sevastopol.

It also is known that bacteriological weapons are being studied in the laboratories of the chemical plants at Dzerzhinsk (near Gorki). Practical tests with chemical bombs are said to have been made south of Khiva (east of the Caspian Sea and south of Lake Aral).

Not quite so secret is the production of special drop tanks for paratroops in a plant at Kazan. The plant receives large allotments of metal for these metal containers and a monthly production of 1,500 units cannot be kept secret.

Success of Soviet research on radiation, especially cosmic radiation, has been considerable. According to Radio Moscow, vertical rockets have attained an altitude of 225 miles repeatedly. • • •

Red Threat Spurs Airpower Build-Up

By ROBERT M. LOEBELSON

The nation last week found itself trying to get a clear picture of American and Russian airpower.

Coming into sharp focus as a result were:

• **An apparent conflict** of ideas between Secretary of State John Foster Dulles and Air Force Secretary Harold E. Talbott.

• **Forthcoming Pentagon** attempts to spur the aircraft industry's research and production activities.

• **Inevitable efforts** to increase USAF budget funds for fiscal 1956 when the Defense money bill reaches the Senate floor.

Discussing Russian aircraft progress, Talbott said in a Chicago speech: "We will keep the size and nature of the Air Force under constant review, and I assure you that the Air Force will react immediately to adjust our force should the Soviet capability so demand."

• **But Talbott's statement** appeared to be at variance with last year's pronunciamento by the Secretary of State when he indicated the new U.S. policy was no longer to react to Russian moves but "to depend primarily upon a great capacity to retaliate, instantly, by means and at places of our choosing."

Russia's ostentatious display of quantities of long- and medium-range jet bombers, a turboprop bomber, an all-weather fighter and a supersonic fighter during May Day rehearsals obviously alarmed the nation's leaders.

While President Eisenhower had told a news conference that "to say that we have lost in a twinkling all of this great technical development and technical excellence as well as the numbers in our total aircraft is just not true," there was no doubt the Pentagon was deeply concerned over Russia's manifest ability to get high performance aircraft into production quickly.

The concern was evidenced in:

• A terse May 13 Pentagon press release describing the Russian fly-bys

UNABRIDGED edition of this cutaway drawing of North American F-100A recently appeared for all to see in Japanese publication Aireview. Full details are withheld here by American Aviation because of F-100's top security classification. This marks second disclosure by Aireview of U. S.-classified data. Earlier breach displayed first sketch of the Douglas C-133 turboprop.

which said "These observations establish a new basis for our estimate of Soviet production of the heavy jet bomber and of the medium bomber."

• USAF Chief of Staff Gen. Nathan F. Twining's declaration that the present 137-wing goal "was a sound one under the conditions that existed when it was made" and his added comment that the new Soviet advances "must be taken into account in the continuous review of our air strength."

• The statement attributed to (but later denied by) Brig. Gen. Woodbury M. Burgess, intelligence chief of the Continental Air Defense Command, to the effect that the Russians "have an air force just as good as ours or maybe better."

• Remarks by the three top AF officials (Talbott, Twining, and Vice Chief Gen. Thomas D. White) about Russia's signs of technological maturity in copying the B-29 bomber in two years, duplicating and improving the British Nene turbojet in less than a year, and touching off a nuclear explosion in three years rather than the 1946 estimate of six to 10 years.

As a result of all this concern, it was a foregone conclusion that the USAF and the Navy (if they had not already done so) would shortly call in representatives of the aircraft industry and urge them to:

• **Reduce** lead-time still more.

• **Accelerate** output of such critically needed aircraft as the Boeing B-52, McDonnell F-101, North American F-100, Convair F-102 and Lockheed F-104.

• **Step up** research and development activities to maintain America's lead (and it may be that the lead is already lost) and to widen it if possible.

There was no good reason why Russia's gains in the air should develop into a political issue, but that seemed to be the way the situation was going.

• **Sen. Stuart Symington** (D., Mo.), Secretary of the Air Force during the Truman Administration and certainly one of the best informed men on airpower on Capitol Hill, repeatedly expressed his worry.

Symington said that "Despite efforts to suppress discussion of the subject, and despite the confusion of official utterances, evidence continues to pile up that communist airpower is moving up to us in offensive striking power, and is moving ahead of us in the fields of defensive power, production, and technology."

• **Sen. Lyndon B. Johnson** (D., Tex.), the majority leader, called on Defense Secretary Charles E. Wilson "to step in and stop this confusion" over whether the U.S. is losing air supremacy. He urged Wilson to give the "true story."

• **Sen. Richard B. Russell** (D., Ga.), asked Pentagon officials to brief his Senate Armed Services Committee "on every aspect of our air strength, from guided missiles on down."

• **But Sen. Leverett Saltonstall** (R., Mass.) declared "we are ready now to meet successfully any and every challenge to our security." He added, however, that in view of the Russian displays, "we cannot afford to be anything but alert and fully prepared."

• **Sen. Styles Bridges** (R., N.H.) indicated "I feel pretty good" after Talbott and Twining testified on the subject before the Senate Military Appropriations subcommittee.

• **And Sen. Edward J. Thye** (R., Minn.) expressed his "positive inner assurance" that President Eisenhower had told the "whole truth" about the situation.

Nevertheless, the question of more money for U.S. airpower in the fiscal 1956 budget was certain to come up in the Senate. The House had already passed the $31.5 billion Defense appropriations bill (including $14.4 billion for the USAF in all and $5.95 billion for aircraft and related procurement) on May 12, i.e., just before the new Russian developments were made public.

• **Talbott denied** that the USAF planned to ask for an increase but Twining had hinted the 137-wing goal might have to be hiked. When Sen. Margaret Chase Smith (R., Me.) asked Assistant AF Secretary Lyle S. Garlock about any increase, he said the matter would be discussed in a closed session. Sen. Thye refused to comment about the possibility of more money but Sen. Bridges indicated that "If the Senate restores the funds originally requested by the AF that will be enough."

(The House cut the AF's budget request from $14,783,678,000 to $14,401-904,000 and the $6,100,000,000 for aircraft buying to $5,950,000,000.)

Symington and other Democrats will certainly try to attach a rider to the money bill if they feel that the Appropriations Committee's recommendations are not enough.

And the Administration itself may choose to ask for a supplemental appropriation later on.

In any event, the nation is definitely less secure now that the Russians have both atomic weapons and the long-range jet airplanes in numbers to deliver them.

Sen. Symington said the one great question everyone now wants to know is "How does our strength compare with the strength of the communists, who have often reiterated their determination to destroy us."

The full answer is still to come.

• • •

Air Force's TAC Assumes New Role

The recent Russian fly-bys of 50 new day fighters, 30 all-weather fighters, 40 medium jet bombers, nine turboprops and 10 long-range bombers and the resulting discussions over whether the U. S. has lost its airpower lead (see page 24) have made many wonder about USAF ability to counter these new plane types.

Naturally, the USAF is thinking principally of the Strategic Air Command and its Convair B-36s, Boeing B-47s and Boeing B-52s as the unit that will do most of the bomb dropping on Russian targets if a global war begins.

But today, the USAF has a second command capable of performing a similar mission. That is the Tactical Air Command whose role is now much more than support of ground troops. AF Vice Chief of Staff Gen. Thomas D. White describes TAC, with headquarters at Langley AFB, Va., as perhaps "the decisive factor" in brush fire and global wars.

• **Most important** reason for TAC's new stature is the decrease in the size of nuclear weapons. Not very long ago, the only aircraft capable of carrying and dropping atomic, and later hydrogen bombs, were bombers like the B-29, B-50, B-47, B-36 and B-52.

Now, however, such TAC aircraft as the Republic F-84F fighter-bomber, the Martin B-57 and Douglas B-66 light bombers, and the Martin TM-61 Matador guided missile are capable of hauling nuclear bombs over both short ranges and also distances. The light bombers get their range boost through in-flight refueling.

Gen. Otto P. Weyland, TAC commander, says some of the command's aircraft presently do not have refueling capability but every type scheduled to be delivered in the future (North American F-100, Lockheed F-104 and Republic F-105), will be so equipped.

• **In the 137-wing** Air Force scheduled to be in existence by July 1957, TAC will have 38 fighter wings. In addition, the 11 transport wings in the program also are considered part of tactical airpower.

TAC, according to Weyland, is presently in an "in-between" position as far as aircraft are concerned. "We are getting the newer high performance jets and larger and faster airlift-type transports we need, but we still have to use some of the older types to meet our operational commitments," Weyland reports.

Discussing Gen. Weyland's organ-

ization recently, AF Vice Chief White made this point: "To meet the threat of lesser wars, our tactical air forces can prove an increasingly effective deterrent. Equally important, if the enemy should ignore the deterrent and start a war, our tactical air forces can be more than helpful. They could be the decisive factor."

While the Strategic Air Command, headed by Gen. Curtis E. LeMay, is still being built up (best evidence is continuing orders for the B-52, KC-135 tanker, F-101 escort fighter, and B-47 medium bomber), Pentagon planners are counting on TAC as SAC's principal companion Gen. White said:

• **"Our tactical** air forces are increasing their readiness, mobility, and flexibility at home and overseas. They will be ready to move instantly to any threatened area, and they will be able to operate from little more than an airstrip.

"Such operations are practical and it is now possible to plan mobile, tactical, striking forces. They can be designed to meet all challenges—large or small. These forces would be ready to take off immediately to any trouble spot on earth. They would take their own supplies and equipment with them for sustained operations . . .

"We are ready to send fully operational tactical air forces equipped with either atomic or non-atomic weapons to a friendly nation to fight side-by-side with its ground troops. Thus tactical air forces give us the ability to maintain the balance of power in any area threatened by aggression.

"Our tactical air forces, with enormous firepower, global mobility, operational flexibility and versatility, have become a deterrent to aggression and a decisive force in war. As such, our Tactical Air Command assumes a place alongside our Strategic Air Command as a potent force for peace."

• **But Gen. Weyland** thinks TAC planes are just on the threshold of the variety of tasks they can perform. "This is especially so," he declares, "when you consider that our nation's stockpile of weapons now includes a range of yields which permit accurate and optimum attacks on the entire spectrum of military targets."

And what of TAC's future? The TAC commander believes his force would be caught short if the U. S. fell behind in research, development, and production. "Right now," says Weyland, "I believe more emphasis is required in the engine field. We need more thrust combined with lighter weight and we need a practical jet reversing mechanism and longer 'in-flight' life between maintenance periods."

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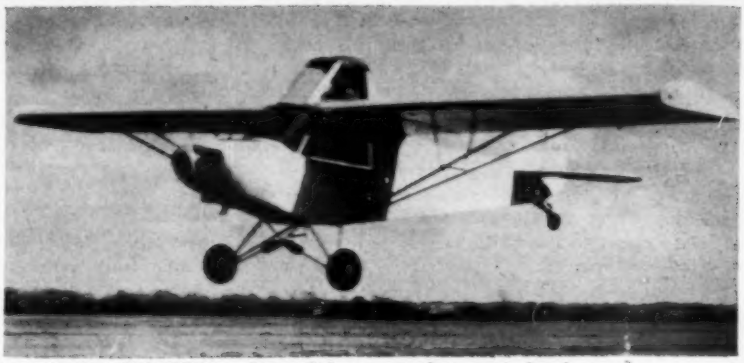


THE 'OHIO PROJECT,' a Piper Cub converted to agricultural use.

New Ag Planes Near Production Stage

Two new agricultural planes are nearly ready for the market: the Larson D-1 and a redesigned Piper J-3 Cub known only as the "Ohio Project."

The D-1 is a Larson Aero Development project and the revamped Cub was designed by the Ohio Aviation Research & Development Foundation, Inc., a non-profit organization.

Larson, whose plant is at Concord, Calif., believes its biplane will be the successor to the Stearman in the agricultural field and figures it will build 100 of the planes the first year after start of production. Price will be $9,000, less power package (which will be the same as the Stearman, 220-225 hp war surplus radial engines—Lycoming, Jacobs and Continental).

Here are the D-1 specs: Span 33 ft.; chord 5 ft.; wing area 315 ft.; empty weight 1,700 lb.; gross 3,600 lb.; wing loading 11.4 lb/sq. ft.; fuel capacity 30 gal. (2½ hr.).

Performance: cruise 90 mph.; land 40 mph.; takeoff distance empty, no wind, 200 ft., with 1,000 lb. load, 600 ft.; rate of climb empty 1,400 fpm.

A number of companies have cooperated in the development of the "Ohio Project": Ohio Seamless Tubing, McCauley Propellers, Aeronca Aircraft, Air Associates, Wellington Sears, Glidden, Ohio Dusting, Goodyear Tire & Rubber, Allied Chemical & Dye, Scott Aviation, Grimes Manufacturing, as well as Ohio State University's School of Aviation, Ohio Aviation Board, Cornell University and Civil Aeronautics Administration.

This plane features a raised pilot's position with rollover structure and the agricultural load under the seat. A 115 hp. engine has been fitted on a new swing-away mount. Clipped, splate-fitted wings have been modified to accommodate fuel tanks. Orlon fabric with butyrate dope covering is fireproof.

Specs: span 29 ft.; length 22 ft. 1 in.; height 8 ft. 6 in.; empty weight 876 lb.; useful load 624 lb.; gross 1,500 lb.

As soon as the "Ohio Project" is certificated, design plans will be made available that will permit any average A & E shop to build a similar plane.

LARSON'S D-1 prototype, claimed a successor to the Stearman.

Above: B-52 bombers on flight line at Boeing Seattle plant

Left: B-52 during a test flight

America's big jet bombers are meeting all schedules

Boeing B-52 global jet bombers are now well into the advanced stages of their flight test program—while production airplanes are coming from the factory on schedule. The airplanes assigned to this continuing test program are averaging nearly twice as many flight hours per month as any previous high-performance aircraft.

This record, in part, is a measure of the success of the B-52 design. It is also a reflection of the huge engineering resources of Boeing's new Flight Test Center—the largest, most complete facility of its kind in the country. This Center enables Boeing to achieve a higher percentage of productive flight test time than was possible before. Programs are planned far ahead, and so organized that on each flight, tests begin the moment the aircraft's wheels leave the ground.

Another part of the B-52's success stems from the earlier experience Boeing gained designing and test-flying the six-jet B-47. The high-altitude frontline B-47 today is the backbone of Strategic Air Command's striking force. It has logged hundreds of thousands of hours of pressurized flight at extreme altitude.

Boeing's experience in this field is unique. For in addition to building more high-altitude, multi-jet aircraft than any other company, Boeing 19 years ago developed the world's first pressurized transport, the Boeing Stratoliner, and the world's first pressurized bomber, the B-29, mighty air weapon of World War II.

Out of this Boeing background grows America's dominant position in the field of pressurized, high-altitude, multi-jet aircraft. It is a position backed by one of the country's largest pools of engineering manpower, by advanced research facilities, and by the Boeing tradition of creating airplanes that open new eras of military and commercial flight.

BOEING

Military Doctrine: A Lethal Punch

Changing times dictate changing military requirements. The current Russian threat to world peace can only be challenged in this air-atomic age by modern aircraft capable of dropping nuclear weapons instantly on the Russian homeland, thus serving as a deterrent to that aggression.

A new book by a rising USAF officer (U. S. Military Doctrine by Brig. Gen. Dale O. Smith; Duell, Sloan & Pearce, New York City; 245 pages; $3.50) points out that for the first time in American history, the nation's military doctrines coincide with the government's executive policy. These four doctrines (professionalism, unity of command, celerity with counter offense, technical application) dovetail completely with the National Security Council's decision to stop trying to react to Russian moves but to depend instead on America's ability to retaliate instantly by methods and at places chosen by the U. S.

• **General Smith** is former director of education at the USAF's Air University, Maxwell AFB, Ala., and is now assigned to the Operations Coordinating Board in Washington—an agency that takes care of the executive action involved in putting National Security Council decisions into effect.

He carefully points out that his book and its comments do not represent any official USAF or Defense Department position, but it might prove difficult to find any high official in the USAF who would disagree with Smith's views.

The highly readable volume, which treats the subject matter in language easily understood by readers not familiar with military terminology, reviews the philosophies of great military leaders of the past in terms of today's problem of defending the U. S. by relying on the strategic bombing concept. At that point, Smith discusses a "doctrine for the future" and the interrelationship between national policy and military policy. Among the general's points:

• It is inconceivable that the U. S. would start a preventive war. However, "once enemy intentions are clear through overt acts of aggression, retaliation is morally acceptable even before we suffer the loss of several cities."

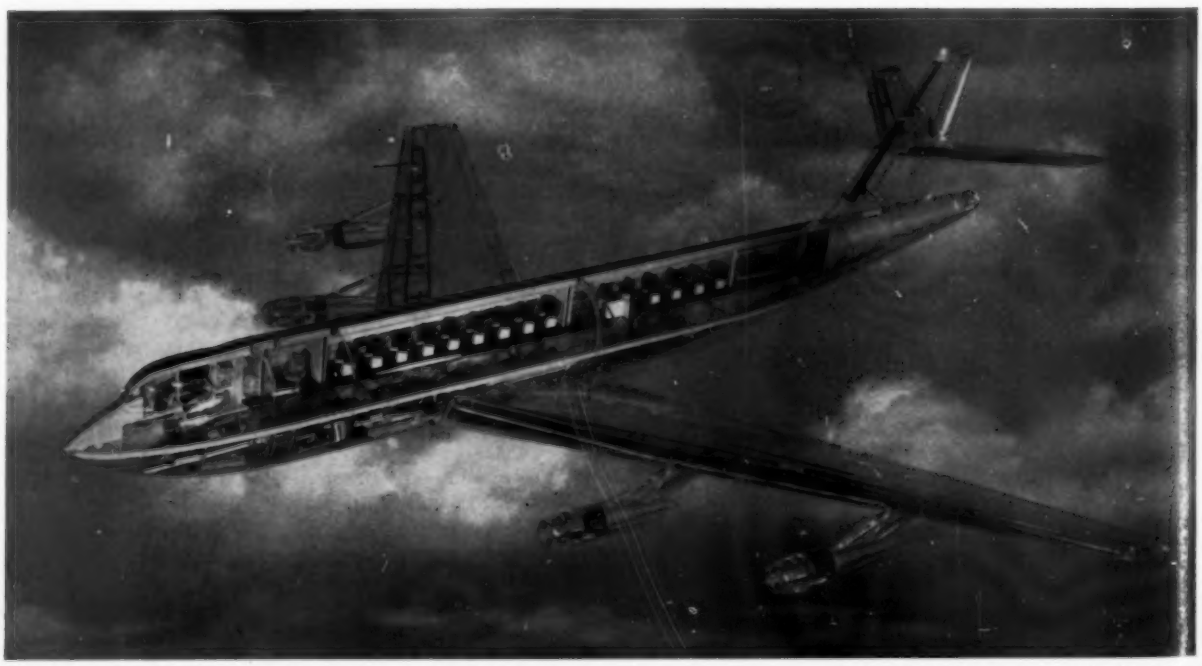
• "Perfect early warning cannot result in perfect air defense simply because human predictions and human coordination are always subject to error." Moreover, "neither air defense nor air offense should be exclusively relied upon, but the two forces in concert can provide us with the optimum chance of successs."

• "A fighter escort is always *desirable* to reduce the risk involved in any air assault and future developments may make an escort mandatory, but at this writing the lack of an escort is hardly a cogent argument against strategic bombardment."

• "Once we have achieved air dominance, the enemy has no recourse but to surrender. The obvious capability to do this during a state of total war should be sufficient to force him to terms. But, suppose he is stubborn and continues to advance with his surface forces. What then? Then we shall be obliged to lay on a massive air siege. Punitive air action can be directed against his natural resources until he comes to terms."

• "Arbitrarily restricting the use of nuclear weapons will obviously return warfare to the concept of multitudes and give a distinct advantage to that nation able to mobilize the greatest manpower."

• "We cannot flirt with suicide by setting aside our firearms as a result of a gentleman's agreement with a non-gentleman . . . and if we retain our arms, and the aggressor retains his, who shall win when the home is threatened? Both will have the technical capacity to kill the other, as in Western gunfights. But the sheriff with enough skill could let the gunman draw and still drop the desperado in his tracks before he fired. *He with the fastest draw and the best aim will survive.* Superior tactics will determine the outcome. Thus the *application* of atomic power becomes the



AIRESEARCH DIVISION of The Garrett Corp. built this six-foot model of a turbine transport, with hypothetical systems to scale, for airline engineers to inspect at the symposium held in Los Angeles. AiResearch told the airline representatives its intent is to have fully compatible components and systems ready for coming turbojet and turboprop operations.

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most salient factor in the survival equation. The accent is on *speed*."

• Military necessity has tended to dictate the choice of weapons, and when their use becomes habitual, questions of weapon morality are forgotten. The course of wisdom would be to prepare to use atomic weapons to the limit, with lightning speed on the draw. We all pray for that day when war can be reduced in fury or eliminated. But until then we must be ready and poised to defend our country through the use of weapons which promise success."

The book's foreword was written by Gen. Carl A. Spaatz, first Chief of Staff of the USAF.

• • •

Aircraft Unions Join Forces for Bargaining

Individual labor unions in the aircraft industry are co-operating at craft levels as top officials of the American Federation of Labor and the Congress of Industrial Organizations, their parent organizations, prepare to merge at the end of the year.

At a recent Washington, D. C., meeting, more than 75 delegates from four unions representing 40,000 employes in 21 Bendix Aviation Corp. plants set up an interim committee to coordinate bargaining objectives. The group also scheduled further meetings of the full delegations.

The Bendix unions represented were International Association of Machinists (IAM-AFL), United Auto Workers (UAW-CIO), International Union of Electrical Workers (IUEW-CIO) and United Steelworkers of America (USA-CIO).

• **The top-level** character of the meeting was emphasized by the appearance and speeches of President Walter Reuther of the CIO, and president A. J. Hayes of the IAM-AFL.

The delegates also approved four separate reports prepared by their own study groups on: (1) health, welfare and pensions; (2) wage incentives and fringe benefits; (3) general contract provisions; and (4) apprenticeships.

The UAW's guaranteed annual wage plan was discussed and the delegates were told that IAM's executive council had voted to give full support to CIO locals now seeking to negotiate that program.

Labor's philosophy and tactics both in the near future and after the merger were disclosed by Hayes. He called attention to "the historic nature of this meeting which marks the placing of another brick in the growing structure of labor unity.

"I don't need to tell you," he added, "that there was a time in the labor movement—and it was not so very long ago—when unions which had contracts with different plants of a multi-plant company used to scan each other's agreements to turn up weaknesses which could be used as a basis for raiding.

• **"That time has gone,"** he said, noting that the Washington conference is the mark of a new day for the labor movement.

"In our various dealings with the Bendix Corp.—as with other multi-plant companies—we of labor have dispersed our strength, while management's position has been unified and consolidated," Hayes pointed out. This meant, he said, that the company could take on the unions one at a time and thus weaken their economic power in case of a shutdown.

"In the days ahead, the Bendix Corporation's negotiators will find themselves facing—not a series of isolated union committees—but various segments of a close-knit Bendix membership, each bound to the other through ties of unity, each negotiating in the full knowledge that behind them lies the united strength of all the others."

Defense Lists Top Contract Awards

Eleven major aircraft companies received a total of $6,753,400,000 in military contracts out of a total of $16,337,200,000 awarded by the U. S. government in the 18-month period ending Dec. 31, 1954. This figure represented a total of 41.4% of all military contracts awarded for the same period, and 60.8% of the $11,109,100,000 in contracts awarded to the 100 companies.

• **United Aircraft Corp.** was first in the current listing, with a total of $1,601,400,000 in awards received during the 18-month period, representing 6.5% of the total.

Next in order were: Douglas Aircraft, North American Aviation, Boeing Airplane, Lockheed Aircraft, General Dynamics, Grumman Aircraft Engineering, Curtiss-Wright, Republic Aviation, Hughes Tool and The Glenn L. Martin Co.

Rank	Company	Millions of Dollars	Percent of U. S. Total	Cumulative Percent of U. S. Total
	Total awards for work in U. S.	$16,337.2	100.0	100.0
	Total, 100 companies and their affiliates	11,109.1	68.0	68.0
1	United Aircraft Corp. & Subs.	1,061.4	6.5	6.5
2	Douglas Aircraft Co., Inc.	1,041.8	6.4	12.9
3	North American Aviation, Inc.	910.2	5.6	18.5
4	Boeing Airplane Co.	764.9	4.7	23.2
5	Lockheed Aircraft Corp. & Subs.	740.8	4.5	27.7
6	General Dynamics Corp. & Subs.	597.9	3.7	31.4
7	Grumman Aircraft Engineering Corp.	377.1	2.3	33.7
8	Curtiss-Wright Corp. & Subs.	340.1	2.1	35.8
9	Republic Aviation Corp.	329.5	2.0	37.8
10	Hughes Tool & Subs.	313.3	1.9	39.7
11	The Glenn L. Martin Co.	276.4	1.7	41.4
13	Bendix Aviation Corp.	214.7	1.3	42.7
14	General Electric Co. & Subs.	213.3	1.3	44.0
15	Fairchild Engine & Airplane	170.2	1.0	45.0
17	Sperry Corp. & Subs.	165.2	1.0	46.0
19	Piasecki Helicopter Corp.	108.7	0.7	46.7
20	Goodyear Tire & Subs.	101.9	0.7	47.3
29	AVCO Manufacturing Corp.	66.6	0.4	47.7
33	Ford Motor Co.	58.4	0.4	48.1
34	Hayes Aircraft Corp.	54.4	0.3	48.4
41	Thompson Products, Inc.	42.8	0.3	48.7
44	Beech Aircraft Corp.	39.3	0.2	48.9
46	Minneapolis-Honeywell	35.9	0.2	49.1
49	General Tire & Subs.	34.8	0.2	49.3
54	Continental Motors & Subs.	32.1	0.2	49.5
55	Hazeltine Corp.	31.5	0.2	49.7
62	General Precision & Subs.	27.6	0.2	49.9
64	Westinghouse Air Brake & Subs.	25.9	0.2	50.1
65	Pan American World Airways	25.2	0.2	50.3
74	Gilfillan Brothers, Inc.	22.2	0.1	50.4
77	Garrett Corp. & Subs.	20.8	0.1	50.5
88	American Bosch Arma Corp.	16.9	0.1	50.6
96	Kaman Aircraft Corp.	14.9	0.1	50.7
100	Hiller Helicopters	14.2	0.1	50.8

A Pentagon report of the 100 principal companies and corporate groups receiving the largest net value of military contracts in this post-Korean period shows that they were awarded a total of 68% of all military business. The table, prepared at the request of the House Select Committee on Small Business and the Senate Banking and Currency Committee, will be issued semi-annually, the Defense Department said.

An AMERICAN AVIATION tabulation disclosed, moreover, that contracts awarded to the 34 aircraft, component and accessory firms listed among the

The new list covered only net new awards made in the 18-month period, instead of the cumulative reports issued since the beginning of the Korean war. Significantly, General Motors, which was first on the list issued Jan. 11, 1954, did not appear among the 100 companies.

The change in ratings of the companies was attributed to the Adminis-

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Twin Coach helps Boeing get them in the air

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The Boeing KC-135 jet tanker-transport is of vital importance to the national defense. The prototype of this airplane—America's first jet transport—is shown above. To produce and deliver KC-135s to the Air Force as rapidly as possible, Boeing enlisted the aid of Twin Coach Aircraft Division as a subcontractor for major airframe assemblies.

This important assignment typifies the way prime contractors rely on Twin Coach Aircraft Division. For Twin is staffed with experienced aircraft specialists to design and build tooling . . . with experienced aircraft production personnel . . . under experienced aircraft supervision and management.

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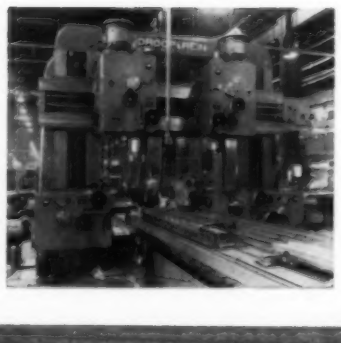


Giant 25-foot Droop & Rein universal planer mill, only one of its kind in the country, was recently installed at Twin Coach Aircraft Division.

tration's new policy placing more reliance on air-atomic defense, as well as to cancellation of large orders for the ground forces following the Korean armistice.

• **As a result** of the decline in the rate of new procurement after the ceasefire in Korea, and cancellations of previous contracts, 45 companies that appeared on the list of 100 for the Korean combat period are not on the post-Korea list. The Pentagon report pointed out that unfilled orders and current deliveries of these 45 companies are not available, but stated "it is certain that many of these companies are still among the largest current military suppliers."

Preceding table shows rankings of the nation's aircraft, component and accessory firms, the dollar value of their contracts, and percentages of business compared with the total awards:

The following list gives the aircraft, component or accessory companies among the 45 firms and corporate groups carried in the June 30, 1953, tabulation of the 100 largest contractors to the military services, who are not among the first 100 companies in the period ending Dec. 31, 1954. The minus signs indicate the amount that cancellations and cutbacks exceeded new procurement awards during the 18-month period:

Rank in June 1953	Company	Amount in Millions
1	General Motors Corp.	$— 58.9
14	Westinghouse Electric Corp.	—255.9
16	Northrop Aircraft & Subs.	— 10.8
19	Kaiser Motors Corp. & Subs.	3.9
21	McDonnell Aircraft Corp.	12.4
	Studebaker-Packard Corp.	—199.3
27	Studebaker Div.	
32	Packard Div.	
28	Bell Aircraft Corp.	—111.4
41	Collins Radio Co.	9.4
62	Rheem Manufacturing Co.	14.1

o o o

President Names AF, Navy Chiefs

President Eisenhower has nominated Gen. Nathan F. Twining for another two-year term as USAF Chief of Staff extending his tenure to June 30, 1957.

Rear Adm. Arleigh A. Burke was simultaneously recommended for two added stars (full admiral) to serve as Chief of Naval Operations until August 16, 1957. He replaces Adm. Robert B. Carney.

President also renominated Adm. Arthur W. Radford as Chairman of the Joint Chiefs of Staff to serve until August, 1957. Gen. Maxwell D. Taylor was recently named Army Chief of Staff to succeed Gen. Matthew Ridgway (AMERICAN AVIATION, May 23).

←Circle No. 11 on Reader Service Card.

AF Asks More Funds for Contract Maintenance

U. S. Air Force, which let its first jet engine overhaul contract to a civil contract maintenance firm this year, is asking $264 million for outside maintenance of aircraft, engines and equipment during fiscal 1956.

New budget request represents a 15% hike over its $230.9-million appropriation this year and a 35% increase over fiscal 1954 award of $195,198,364.

Current AF policy, according to Col. K. W. Dech, programs development chief in Directorate of Maintenance Engineering, is to contract workloads in excess of depot maintenance capacity to commercial companies. Policy emphasizes:

• **Use of prime** manufacturers if their continued availability is judged essential to U. S. defense.

• **Use of commercial** maintenance contractors to supplement depot maintenance on aircraft and engines common to USAF and commercial airline operation.

• **Use of prime** manufacturers to work out analytical contracts when to USAF advantage.

Here's how Air Force contract maintenance spending for past years compares with money sought next year.

Item	1954	1955	1956
Aircraft maintenance	$102,674,340	$122,827,000	$141,195,000
Aircraft engine maintenance	23,228,605	34,170,000	43,180,000
Aircraft/engine accessory maint.	22,447,812	21,861,000	32,584,000
Electronics/communication equipment	12,102,299	11,775,000	19,073,000
Ground-powered/marine equipment	10,931,108	11,313,000	7,152,000
Other equipment/materiel maint.	14,054,282	11,082,000	18,543,000
Storage-ground equipment	9,759,918	7,850,000	3,180,000
TOTAL	$195,198,364	$230,878,000	$264,907,000

Organization

• Securities & Exchange Commission has authorized **Bell Aircraft Corp.** to sell 29,989 shares of its subsidiary, Erie Insurance Co. (Iowa), to **Equity Corp.** for $499,817. Equity owns more than 51% of Bell stock.

• **Roadable Corp. of America,** Buffalo, N. Y., has been formed by ex-Bell Aircraft Engineers C. R. Haig, Jr., and H. A. Hamilton, Jr., to develop a roadable aircraft design. Construction of a full-scale flight test model is underway and first flight is expected this fall. Wing span is 27 feet and overall length is over 18 feet.

Contracts

• **Pastushin Aviation Corp.** received a $1,939,000 contract from Douglas-El Segundo to build jettisonable fuel tanks for Navy AD-5, AD-6, A4D and F4D aircraft.

• **Temco Aircraft Corp.** will build photo nose sections for USAF RF-101A twin-jet reconnaissance aircraft under a contract let by **McDonnell Aircraft Corp.**

• Additional power packages for Convair 340 aircraft will be produced by **Rohr Aircraft Corp.** under a $1,250,000 order placed by Convair-San Diego.

PROFIT & LOSS

Firm	Period Ended	Current Net	Previous Net	Earnings Common Share Current	Earnings Common Share Previous
Aeroquip Corp.	Q 3/31	$ 448,967	$ 175,521	$....	$....
	6 mos. 3/31	850,983	301,876	....	....
Bendix Avn. Corp.	6 mos. 3/31	12,964,705	11,113,148	....	....
Braniff Airways	Q 3/31	488,558	72,637	0.35	....
Capital Airlines	Q 3/31	301,142	(—)710,940	....	....
Continental Air Lines	Q 3/31	83,969	126,023	0.18	0.32
Okanagan Helicopters, Ltd.	1954	41,449	14,541	....	....
United Aircraft Corp.	Q 3/31	6,996,757	6,509,059	2.06	1.92

DIVIDENDS

Firm	Period	Amount	Payable	Record Date
American Airlines	..	20¢	June 20	June 3
McDonnell Aircraft	Q	25¢	June 1	June 17
Sperry Corp.	Q	50¢	June 22	June 1
Solar Aircraft	Q	25¢	July 15	June 30

Production

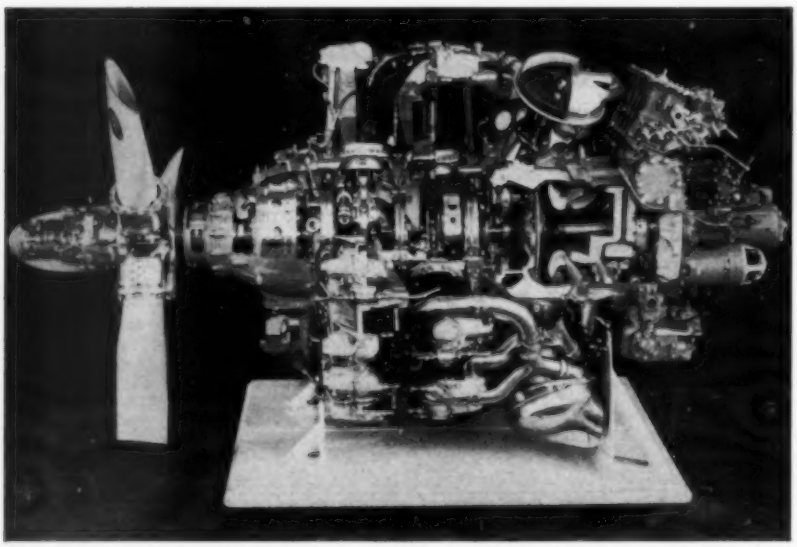
Wright Readies Its New Turbo Compounds

By J. S. MURPHY

DESPITE ITS relatively late arrival on the commercial aircraft engine scene, Curtiss-Wright's Turbo Compound is well on its way to becoming the Number One powerplant of airline 4-engine transports.

The current wave of orders and reorders for Douglas DC-7 and Lockheed 1049 and 1649 aircraft has spiralled the number of TC-fitted transports close to the 400 mark.

At this figure, it will surpass Pratt & Whitney's R2800 series, which still powers most 4-engine airline planes. Although some new orders for DC-6As and DC-6Bs using R2800s continue, the total now delivered or being built numbers only slightly more than 350, still short of the Turbo Compound.



WRIGHT'S TURBO COMPOUND—Well on the way to becoming the No. 1 power plant for airline 4-engine transports.

Under the fresh impetus of demands for newer higher-powered Turbo Compound models, C-W's Wright Aeronautical Division is gearing its engineering and production staffs to meet a heavy delivery schedule extending through 1957.

To date Curtiss-Wright has delivered over 1300 commercial Turbo Compounds. With firm orders still to be filled this year and next, output will pass the 2,000 mark. Additional aircraft buying and provisioning for spare engines will surely bring the total close to 2,500 by 1957.

• **Later this month,** its EA1 model, which will power the Douglas DC-7C, is slated to start 150-hour CAA qualification testing. It is rated at 3,400 hp for dry takeoff, an increase of 150 hp over predecessor DA series TC-engines. The EA also provides 2,800 METO (maximum except takeoff) power, a 100 hp increase over current DA3 and DA4 engines.

• **Next in line,** the Model EA2, will be ready for certification tests in late summer or early fall. Rated the same as the EA1, it will undergo the complete 150-hour test run to prove out a special 0.355:1 reduction gear to drive the 16-foot, 10-inch diameter, three-bladed propellers on Lockheed's new 1649 Super Constellations ordered by Trans World Airlines.

Improvements going into EA engines now make possible a Turbo Compound with a 4,000-hp wet rating, C-W officials told AMERICAN AVIATION. EAs already are rated at 3,700 takeoff horsepower with water injection, they explain, and test models have been run well above 4,000 hp dry during parts proofing trials.

• **Only major change** they look to in a 4,000-hp Turbo Compound, should an airline see a future need for the engine, would be increased capacity main bearings. Special reduction gearing in the EA2 is already rated at 4,000 hp.

Turbo Compound engineering program at Wright is a big one, ranking third only to its J67 and J65 jet projects in engineer staffing. According to one official, the company is putting more effort into TC engineering today than on all other piston engines to date.

Emphasis throughout the program is in three directions: to increase the engine's critical altitude at cruise power; to improve overall durability, and to ease its maintenance and overhaul.

Target is to raise both low and high blower cruise critical altitudes an added 2,000 to 5,000 feet. At maximum, this would give the engine a 16,600-ft. level in low blower and 25,600 in high and permit airlines to take full advantage of the altitude capabilities of the aircraft without loss of engine performance.

• **Main area of emphasis** in this development is in improved supercharger inducer, impeller and diffuser design. Efforts by Wright, the National Advisory Committee for Aeronautics and a major airframe manufacturer are producing some "real interesting results" in bettering the efficiency of centrifugal flow compressors, and the project at C-W is now in full-scale development.

C-W efforts to improve engine durability are producing more immediate results in the EA engines. Officials make no secret of the fact that earlier DA engines came into their share of the problems usually associated with new production engines.

As a result, a 21-item list of fixes based on earlier DA engine failure history is guiding the program for improved durability in the EA1 and EA2 models.

Major fixes already slated for these engines include:

• **New Pistons**—EA engines will incorporate an entirely new piston using a special aluminum alloy identified as WAD Spec. 6233.

Tests at C-W show that new alloy has 20% greater structural integrity at 500°F. operating temperatures than the AMS-4140 alloy formerly used. Once cleared in the bill of materials for the EA series, Wright expects to make it available for pistons in earlier DA series Turbo Compounds as well as non-compounded R3350 engines.

• **Cam and Tappet Design**—Completely new crankcase construction in the EA series allows needed space for use of "beefed up" cam and cam tappet mechanisms. Improvements here involve heavier rims, heavier flanges, and stronger gears employing more gear teeth.

In the EA2 engine, 25 pounds of a 100-pound increase in engine weight over the EA1 is accounted for by a replacement of the magnesium cam tappet housing. In the new design the

"LEARNING TO FLY" is Mike Whitehead who's getting his last-minute instructions from Captain Warren Hitt.

Braniff families get briefed with a party!

It was "family night" at Braniff's Dallas Headquarters and a tremendous success it was. What wife wouldn't like to see her husband's business in action? And what small fry wouldn't have a field day in the middle of all that airplane excitement? 1,500 Braniff families turned out — to meet the top executives, tour the base, learn all about what it takes to keep them flying. In fact, two Braniff captains gave "lessons" to the youngsters in cockpits of real DC-6s and Super Convairs!

Officials and supervisors acted as hosts and guides, and, sooner or later, everyone was guided to Hangar 2 where hostesses served refreshments. Throughout the huge base, special exhibits and displays were set up to explain things from Public Relations to Maintenance. There was a grand prize, someone's just for the drawing, too. And, so nobody would forget how much fun the evening was die-casting machines stamped out ash trays, souvenirs of the occasion. Everyone thought it was a fine idea — so much so it's a regular event at Braniff now!

PRESIDENT AND MRS. CHARLES E. BEARD welcome a Braniff family to the big open house party at Dallas Headquarters.

WINNER OF FAMILY NIGHT drawing was Mrs. Helen Pool (shown with year-old Janice). Here she claims her grand prize from Evan Lingle, arrangements coordinator for the evening.

BRANIFF *International* **AIRWAYS**

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housing becomes an integral lip or flange of the steel rear main crankcase.

• **Impeller Drive Mechanism**—A long list of fixes engineered by C-W in the DA engines has led to a complete redesign of the EA impeller system to overcome clutch plate and high impact torque problems. Main feature is a built-in "slip" to be provided in the supercharger shift mechanism by a hydraulic delay arrangement which will reduce impact torque when shifting from low to high blower.

• **Cylinders**—Principal design improvements in EA cylinders will include heavier cylinder hold-down flanges, thicker barrel walls, and redesign of the cylinder head port cavity for improved combustion. In addition, more cylinder head fin area is being provided on the exhaust side for improved cooling.

TURBO COMPOUND BOX SCORE

(Aircraft Delivered or On Order)

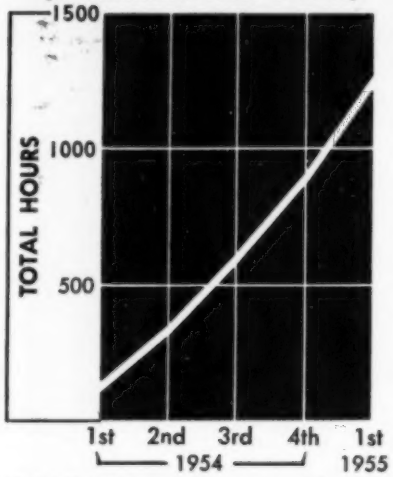
	No. and Type Aircraft				
U. S. Carriers	DC-7	DC-7B	DC-7C	1049	1649
American	39	..	..	..	..
Braniff	7	..	..	..	..
Delta C&S	15	..	..	..	..
Eastern	..	20	..	16	..
National	4	..	..	..	..
Northwest	..	..	8	4	..
Pan American-Grace	..	5	..	..	..
Pan American	..	7	33	..	..
Seab'rd & West.	..	..	..	4	..
Trans World	..	..	..	20	24
United	42	..	..	..	..
Foreign Carriers					
Air France	..	..	..	20	..
Air India	..	..	..	5	..
Avianca	..	..	..	4	..
British Overseas	..	..	10	..	..
Cubana	..	..	..	3	..
Iberia	..	..	..	3	..
KLM	..	..	10	17	..
LAV	..	..	..	3	..
Lufthansa	..	..	..	8	..
Pakistan	..	..	..	3	..
TAP (Portugal)	..	..	..	3	..
Qantas (Australia)	..	..	..	12	..
Sabena	..	..	6	..	..
SAS	..	..	8	..	..
South African	..	..	3	..	..
Swissair	..	..	4	..	..
Thai Airways	..	..	..	2	..
Trans-Canada	..	..	..	9	..
Varig (Brazil)	..	..	..	3	..
TOTAL	107	32	82	139	24

Over and above these fixes for improved engine life, additional changes in the EA series will speed Turbo Compound servicing during maintenance and overhaul.

Standout among these is a new fuel injection pump flush-mounting arrangement on the engine supercharger rear housing. It eliminates the complex and time-consuming arrangement on earlier models in which it was necessary to line up 9 individual studs and fuel lines for proper installation.

Turbo Compound Flying Time

(In Accumulative 1000's of Hours)



WITHIN TWO YEARS engine service time has passed the million-hour mark.

In this same direction, C-W has developed a 3-piece power recovery turbine nozzle box that dispenses with the past need for entire disassembly to repair a single section. In the new engines, the 3-piece layout is related directly to the 120-degree spacing of nozzle box intake pipes and will confine maintenance activity to the particular section requiring repair.

• **Aim at Curtiss-Wright** is to bring Turbo Compound overhaul periods up to the level of Wright's earlier R3350 BD engines. As one official views it "the Turbo Compound has got to be as good as the 2,000-hour BD engine," and it is obvious the entire durability program is slanted in this direction.

Highest overhaul period on TC engines recorded to date is 1,400 hours operated by Air France with Lockheed 1049Cs. Closest to this is KLM's 1,200-hour scheduling, also with 1049Cs, while five carriers (American, Avianca, Delta-C&S, Eastern and Qantas) are now at 1,000 hours.

Main reason for low overhaul periods in most operations is the newness of the engine. Less than two years have passed since first introduction of Turbo Compounds in airline service in August, 1953, and extension of overhaul periods is a time-consuming process.

But in this short interval of operation, the Turbo Compound's penetration of the world airline market has been little short of spectacular. At present count (see chart) thirty U. S. and foreign carriers have ordered or accepted 384 Douglas or Lockheed aircraft with Turbo Compounds. Orders now under negotiation will probably add two new names to the list and swell the total beyond the 400 mark.

• **With this prospect** in view, C-W will have tapped virtually the entire potential market of carriers for its engine. In the U. S., excluding local service airlines, eight of a possible 13 trunk carriers have already bought, and all U. S. international airlines are now Turbo Compound customers.

On the foreign airline scene, twenty of a list of 34 recognized carriers are already on the list, with only Japan Air Lines and Aerolineas Argentinas considered among the remaining potential operators still unsigned.

On the military side, TC engines power the Lockheed R7V-1, WV-1, WV-2, and P2V-3 through -7 Navy aircraft and C-121C and RC-121D for the U. S. Air Force. Newer versions of the WV series (WV-3 and WV-4) are also reportedly equipped or being considered with Turbo Compound engines.

Other than Lockheed, military installations include the USAF Fairchild C-119F, G and H, Navy R4Q (Marine version of the C-119) and the Martin P5M. Canadair, Ltd. is adapting the Bristol Brittania CL-28 reconnaissance transport, originally designed for turboprops, to accommodate Turbo Compounds for service in the RCAF as an early warning radar aircraft. • • •

CAA Certificates Two New Transports

Latest models of two new transports, Douglas' DC-7B and Lockheed's 1049G Super Constellation, have been certificated by CAA.

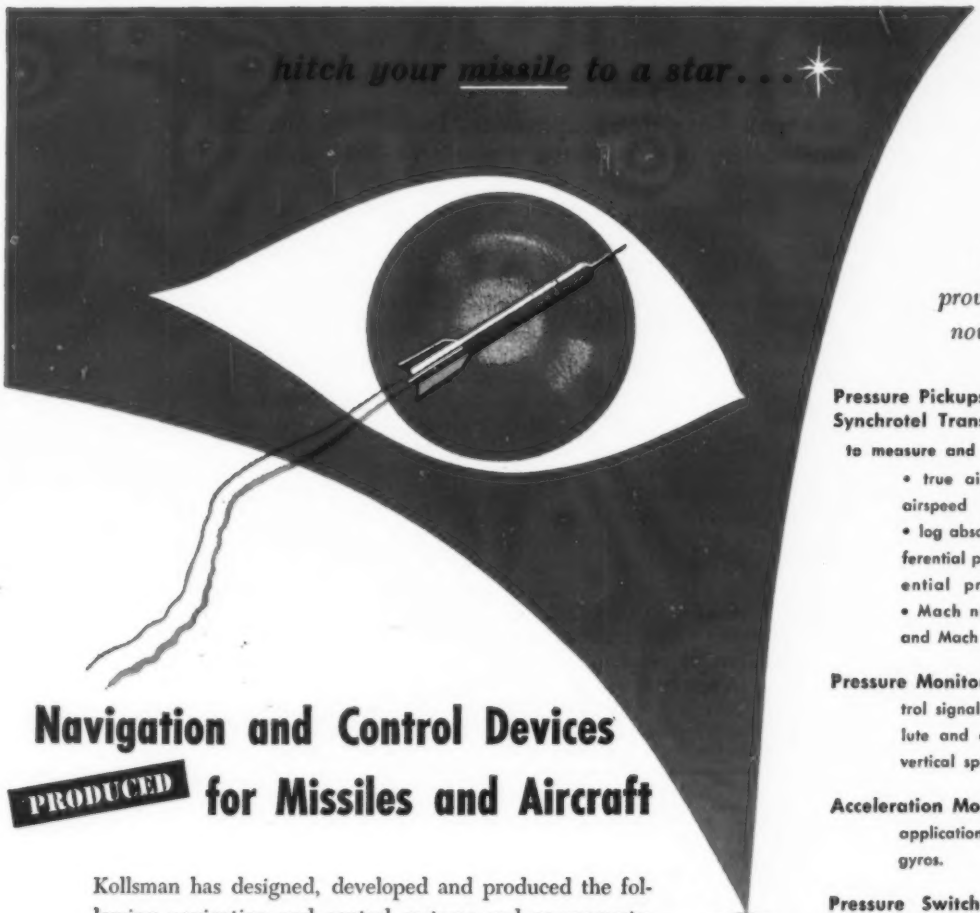
DC-7B approval on May 24 preceded delivery of the first two aircraft to Pan American World Airways. Eastern Air Lines' initial DC-7B acceptance was imminent at press time.

Final certificate approved a 126,000-pound gross weight compared to an original guarantee of 125,000 pounds.

CAA also completed certification of Lockheed's 1049G for higher weights. Aircraft is now approved for 137,500 take-off gross and 113,000 pounds for landing.

WADC Needs Engineers

Wright Air Development Center, Wright-Patterson AFB, Ohio, is in the market for a number of aeronautical engineers ranging from flight test to aerodynamics development. Salary range: $4,035 to $7,040. Anyone interested should contact R. A. Morrissey, chief of the Professional and Scientific Placement Section, Civilian Personnel Division at WADC.



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CLASSIFIED **Automatic Astrocompasses** for precise automatic celestial directional reference and navigation.

Photoelectric Tracking Systems For many years Kollsman has specialized in high precision tracking systems.

Periscopic Sextants for manual celestial observations.

CLASSIFIED **Computing Systems** to provide precise data for automatic navigation and guidance, operated by optical, electromechanical, and pressure sensing components.

Photoelectric Sextant

FOR CONTROL

proven components now in production

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to measure and electrically transmit • true airspeed • indicated airspeed • absolute pressure • log absolute pressure • differential pressure • log differential pressure • altitude • Mach number • airspeed and Mach number.

Pressure Monitors — to provide control signals for altitude, absolute and differential pressure, vertical speed, etc.

Acceleration Monitors — for many applications now served by gyros.

Pressure Switches — actuated by static pressure, differential pressure, rate of change of static pressure, rate of climb or descent, etc.

Motors — miniature, special purpose, including new designs with integral gear heads.

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Technical bulletins are available on most of the devices mentioned.

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Common Navaid System Debate Continues Hot

Here are some new developments, including promise of early availability of 'private flyer' TACAN equipment.

By HENRY P. STEIER

Rapid advances in the electronic science and art pose dilemmas each day in the procurement of military devices that give the U.S. lead-time over the potential attacker. The TACAN-VOR/DME issue, keyed to both civil and military aircraft operations, is an especially pertinent example of a choice made in favor "of careful system engineering rather than unplanned accumulation of gadgetry," as expressed by Radio Technical Commission for Aeronautics' report from SC-31.

• **In defense** of TACAN, before the House Committee on Government Operations in March 1955, Asst. AF Secretary Trevor Gardner said, "We are gambling lead-time against ingenuity to outguess the 'bugs.' It happens in every procurement; it just shows more in this one."

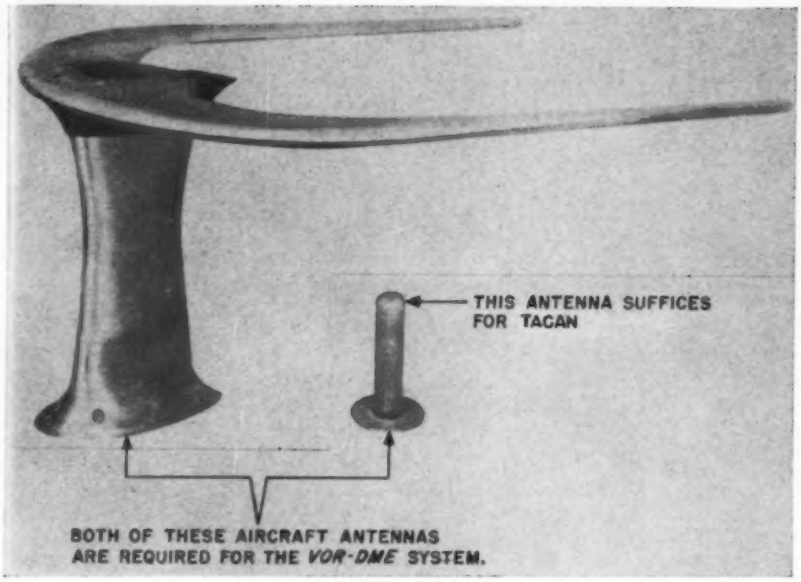
Showing recently in the legislative department were: Military expenditures estimated at about $300 million for R&D and procurement of TACAN equipment as revealed in testimony of Maj. Gen. Gordon Blake before the House Subcommittee on Air Force appropriations; an Air Coordinating Committee approved program on short distance navigation systems; House Commerce Committee recommendations on timing and technical development of civil TACAN equipment; strong opposition by the Aircraft Owners and Pilots Association to a "junking" philosophy concerning VOR/DME.

• **ACC's domestic** interim military tactical program called for "minimum" implementation of TACAN necessary to meet tactical requirements, but in accordance with policy "to be" developed by ACC. ACC's Common System program provided for continuance of VOR/DME until "some succeeding Common System is adopted and installed on the Federal Airways." If TACAN is that system, ACC only "estimates" that VOR will be continued until 1965 and DME until 1960.

Citing undetermined factors as: Number of non-interfering channels available to TACAN; channels required for the common military system and the interim tactical system; relationship of TACAN to continental defense plans, ACC recommended study of those items by ANDB.

A "first priority" item is ANDB's direction of TACAN development for Common System use.

DIAGRAM of fully developed coordinated navigation system using one antenna and multiple channel transmitter and receiver, compared with conventional system having independent units for those functions. Typical tube counts are shown.



Second priority was given to studies on a third rho-theta system.

Third priority was given to ANDB's study of improved siting techniques for VOR/DME, co-location of VOR/DME-TACAN antennas, and conversion of DME ground equipment to serve as "low powered" TACAN terminal facilities.

• **Following ACC's** agreement, the House Commerce Committee "concurred generally" in the ACC program, except that they recommended DME be continued on a year-to-year basis after 1958 to discourage further investment. The Committee urged the Defense Department to declassify TACAN "at the earliest possible date," and development of TACAN airborne units for civil use that "have cost and performance characteristics compatible with the user's needs and flight safety," including "miniaturized versions suitable for use by private pilots."

• **Still resting** on the House Rules Committee agenda is the S. Con. Res. 16 calling for establishment of a joint congressional committee to investigate the air navigation systems dispute. Rep. Percy Priest (D-Tenn), chairman of the House Commerce Committee, indicated he "sees no need" for a joint congressional investigation.

• **Some of the TACAN** system design reasoning came to light at a press gathering called by Gen. P. C. Sandretto, vice pres. and technical director of Federal Telecommunications Laboratories division of IT&T. Sandretto, calling upon people to read the Air Traffic Control paper 27-48/DO-12 prepared by RTCA SC-31 said, "With hardly any qualifications, the TACAN equipment and its *further development* is completely described . . . by the SC-31's reports stated requirement for basic aircraft equipment elements of the Air Navigation and Traffic Control System."

From the report, the "Navigation Equipment is a transmitter-receiver having multiple channels. This equipment with associated ground equipment:

• "Provides distance and bearing information for navigation. These data, when used in conjunction with a computer will allow the pilot to fly any desired course.

• "Provides precise slope, localizer, and distance information for instrument approaches.

• "Provides information for airport surface navigation . . .

• "Provides air-ground aural communication . . .

• "Provides suitable output to allow aircraft to be automatically flown, either en route or during final approach or landing."

• **Electronic equipment** reliability, called "one of two military problems approaching the acute stage" by Gen. Gordon A. Blake, was described by Sandretto as "the horrible truth of electronics" revealed in examining the probability of failure on a ten hour flight.

Probability of failure, using Research and Development Board figures on vacuum tubes, was compared for a "conventional system" of air navigation using 151 tubes, and a "coordinated system" using 76 tubes. Using a multiple channel transmitter and receiver system, probability is 28% against 48% for the conventional system, based upon a 10-hour flight.

Duplication of equipment permitted by the integration of functions in smaller size equipment would reduce the probability to 8%, thus giving a pilot a better chance for a completed mission, Sandretto said.

• **Multiplicity** of antennas required by present navigation aids would be eliminated in the TACAN system. As specified in SC-31's report, the coordinated system does not "require an airborne antenna system which is appreciably detrimental to the performance of high-speed aircraft." One six-inch antenna will do the job.

Using modern information theory to determine the number of binary digits needed to provide DME, Radar Beacon, VOR, Localizer, Glide Slope and Marker information, FTL showed that 6,382 binary digits are required.

A one-megacycle channel, using the same theory, provides space for 1,590,000 "bits" of information under a 2-to-1 signal noise ratio condition. Thus, even a one-megacycle band theoretically provides 250 times the information now needed for the named aids.

Present DME band covers 27 megacycles at each end of the 960- to 1215-mc band. Full development of TACAN would further release band space in the 75- 108- 225-mc bands.

• **Sandretto's position** is that the CAA Ground DMEs should be modified to give service to the airborne TACAN equipment, since the *pulse multiplex* system now used "forms no part of the SC-31 program but is the *real* point of departure from that program."

This, he said, has been done "breadboard" style for $200, but that a conversion for field use would be less than $2,000. He proposes scrapping "the few existing civil airborne DME equipments." As to VOR, he sees no reason why it should go. "You couldn't possibly shut it down, it's there doing a good job in a limited way."

• **Cost and size** of the civil private flyer TACAN equipment have received some attention from FTL. They expect to be able to demonstrate such equipment in July 1955. Plans are to have a

LATEST "Private Flyer TACAN" unit soon to be flown by F.T.L.

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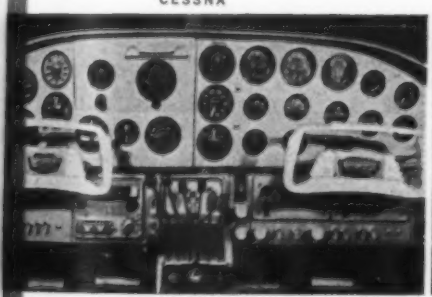

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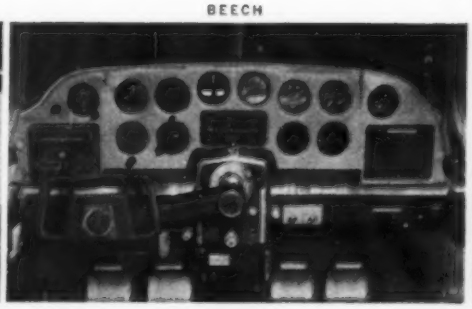
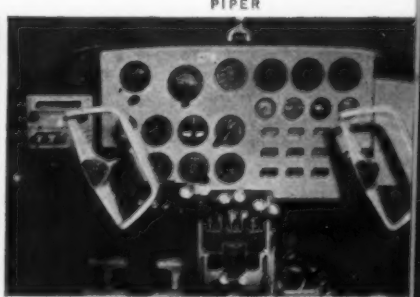


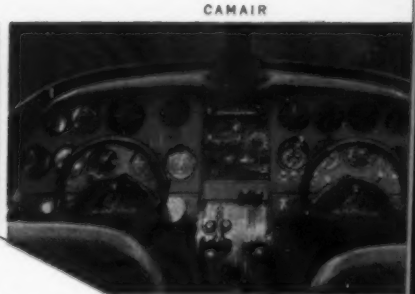
PIPER

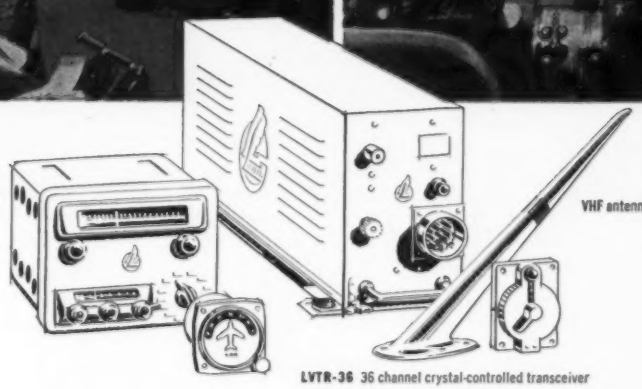


AERO COMMANDER

BELL

CAMAIR





LTRA-6 VHF transceiver, OmniMeter, LF receiver

VHF antenna

LVTR-36 36 channel crystal-controlled transceiver

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Electronics

unit providing azimuth, distance, and radar beacon information using "35 to 37" tubes.

At a cost based on about $45 per tube, the price would be near $1,700. Weight of 25 pounds is planned. Relatively inexpensive, such a "package" would eliminate necessity for separate installations for each facility. FTL plans a completed unit to be available for production in October 1955. • • •

Electronotes

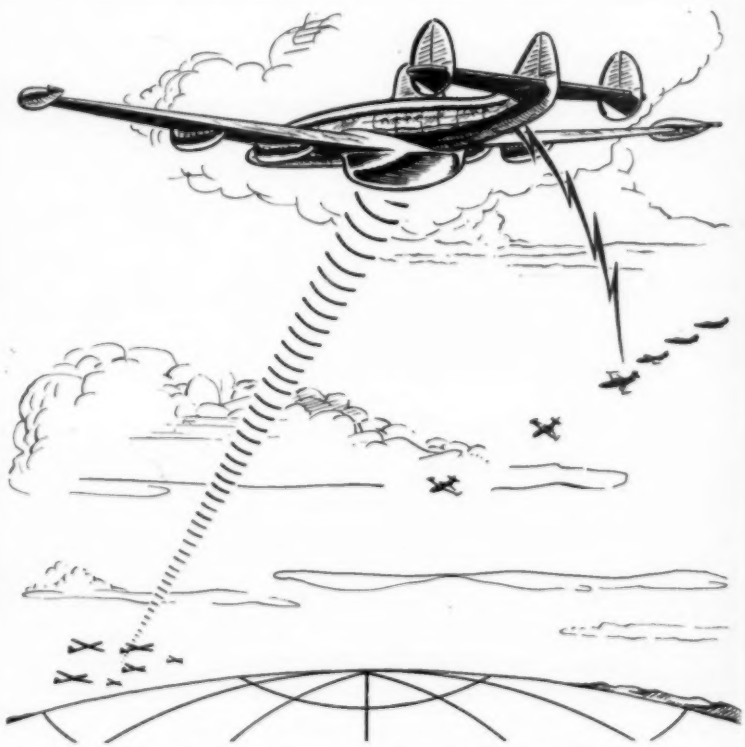
• **Raytheon's** new silicon power rectifier, thimble-sized replaces a thirty pound rectifier carried on most military and commercial aircraft. New unit weighs one pound, operates at 371° F., and handles to 15 amperes.

• **An all-transitorized** automatic navigation and landing system made by Bendix Eclipse Pioneer Division was recently flown. The unit consists of a transitorized automatic pilot and computer that are part of Bendix's integrated navigation flight system.

• **A simulator** to test the airborne portion of TACAN allows a test operator to "fly" the TACAN ARN-21 on the ground. A Hoffman Electronics Corp. product, it is designated SKS-103.

• **A computer** made by Ford Instrument Co. for the Air Force gives a continuous indication of latitude and longitude, and course and distance to a predetermined point. Designated as ASN/7 speed range of the system will be 2,000 knots.

• **General Electric's warranty** period for GE transistors will be extended to one year. Their tests show as high as 98 per cent survival after 10,000 hours at full rated capacity. GE uses mechanized production facilities to produce the transistors.



WV-2 Plots Courses for Fighter Planes

The Lockheed WV-2 radar laden plane sketched above is being used as a Navy Combat Information Center, providing plots for intercept courses for fighter aircraft.

Housed beneath the fuselage is a 17-foot long parabolic section search radar antenna; housed above the fuselage is the height finding antenna. Total equipment weighs two tons. Five radarscope operators are included in the crew.

Size and weight of the radar equipment has been kept down by extensive use of printed circuitry. The WV-2 has a more than 24-hour range. Similar planes, designated RC-121s are used by Air Force as flying radar stations to supplement and extend coverage of our land-based radar "fences" in the U.S. and Canada.

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AS LOW AS $2.86* PER ENGINE OPERATING HOUR...PAC reliability has improved average operating time for all contract customers · PAC absorbs your current inventory · No more inventory investment · No more inventory obsolescence · No more parts shortages.

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When ONLY ROBINSON

SHOCK and VIBRATION CONTROL for AIRBORNE EQUIPMENT

Only Robinson will do when, for best performance, you ***must*** have complete protection of vulnerable equipment against shock or vibration—

Or, when you ***must*** save weight and cost of a device, and only greater protection will make this possible. ***You can build a thing stronger or shake it less: the latter is by far the more economical procedure.***

Note that even the latest specifications for shock and vibration control are becoming obsolete, because of the rapidity of aeronautical progress.

Unprecedented engine power, speeds, and extremes of temperature subject electronic equipment to conditions never before encountered.

Unless these sensitive devices are fully and properly protected, their performance is interfered with, and their service life shortened.

At stake are no less than the safety of pilots and passengers, the performance of civil and military aircraft, and huge deterioration costs of equipment.

In the military field, it is not too much to say that the performance of jet aircraft and guided missiles is limited by the degree of protection afforded their control mechanisms. ***The success of a mission — the defense of an area — may stand on the performance of shock and vibration control mountings.***

Circle No. 16 on Reader Service Card.

WHAT TYPES OF CONTROLS ARE AVAILABLE?

Starting with crude rubber and springs, progress in shock and vibration control has now resulted in ***one*** and ***only one*** method for energy dissipation, which has ***all*** the following essentials:

1. Degree of control commensurate with shock or vibration to be controlled.
2. Multi-directional absorption—i.e., handling of shock and vibration from every angle.
3. Indifference to extremes of heat and cold and the presence of dirt, oil, grease, or other deteriorative influences.
4. Insurance against installation errors; reduction of installation time.
5. Long extended and unchanging performance of mountings.
6. Effective reduction of bulk, weight, and cost of equipment protected, from 15% to 25%.

Only in Robinson all metal mounts and Met-L-Flex Engineered Systems are all six of these essentials available. ***A direct comparison between Robinson and any other method under consideration will quickly prove the presence or absence of these vital characteristics.***

THE INADEQUACY OF SPRINGS

Springs alone, or combined with auxiliary dampers, where the springs do most of the work, have been outmoded by the Robinson resilient cushion concept. Spring-damping combinations fail because:

1. They are linear in action, and unable to cope with varying loads, or to afford protection against dynamic overloads.
2. They vary in performance with altitude and reduced atmospheric pressure and when dirt, oil, and moisture affect the surface friction between spring and damping devices.
3. Their service life is definitely limited.

HOW ROBINSON ALONE OVERCOMES THESE DIFFICULTIES

The fundamental advantage of all Robinson shock and vibration control is the dissipation of energy by means of fabricated wire resilient cushions and shock pads of patented Met-L-Flex.

These cushions, ***which are exclusive with Robinson,*** have the following advantages:

1. They possess inherent damping throughout, nearly five times greater than rubber.
2. Their interlocking wire loops resist compression progressively as the load increases.
3. They are highly effective in multi-directional design and application.
4. They are completely unaffected by changing atmospheric pressures; high or low temperatures; dirt, oil, moisture, or other deteriorative influences.
5. They provide ample protection against dynamic overloads.
6. Their service life is practically unlimited.

Note that in the Robinson Mounting, the spring that surrounds the Met-L-Flex cushion acts as a retainer, and handles only a small part of the work to be done. It is the cushion that carries the load.

WHAT ARE ROBINSON SYSTEMS?

Years of engineering experience supplying shock and vibration controls to more than 500 aircraft and commercial users have taught us that each job is a separate and individual problem. Good as the Robinson individual mount is, our engineered systems are not made simply by attaching a number of mounts to a tray. Using the engineering essentials incorporated in the basic Robinson concept, Robinson ***engineers each shock and vibration control system for the work to be done***—the maximum performance and protection of the equipment involved.

WHO USES ROBINSON?

Robinson is a leading supplier to the Government of shock and vibration control systems for the protection of airborne electronic equipment. Robinson Systems are in actual use in practically every military and commercial aircraft now flying and in a number of guided missiles; hundreds of designs are on our drawing boards for controls to be used in aircraft of the future. Robinson Systems are used by most of the leading manufacturers of military and civilian mobile ground equipment, by makers of light and heavy machinery, and by producers of shipping and carrying containers.

WHAT IS ROBINSON'S HISTORY?

Robinson has pioneered in the solution of shock and vibration control problems since 1936, culminating in the development of the revolutionary Met-L-Flex cushion first marketed in 1950.

In 1947 Robinson received from the Navy Department the award for "outstanding cooperation and assistance in producing for the Naval Service new and radically different shock mounts which greatly decreased electronic equipment failures due to vibration."

Steady advances have been made in all-metal mounts and systems, in multi-directional mountings (which Robinson has quantity-produced for 4 years), in fully engineered protection. Years of research, laboratory work and practical applications have enabled Robinson Mounting Systems to cope uniquely with the formidable problems involved in our defense operations. Robinson now supplies both the airborne and the industrial fields, serving its clients by both Eastern and West Coast engineering staffs.

The business of Robinson Aviation, Inc. has increased 8-fold in the past five years.

A WORD OF WARNING

Robinson success and the pressing need for effective shock and vibration control have encouraged the manufacture of low cost mounts and so-called systems which are definitely inadequate for the job that must be done. ***While such devices may meet existing specifications, they may not fulfill the actual requirements of this jet and atomic age.***

Robinson seeks only a clear definition of the work to be done, and an engineering appraisal of all available devices aimed at doing it. ***It is on this direct comparison that Robinson success has been built.***

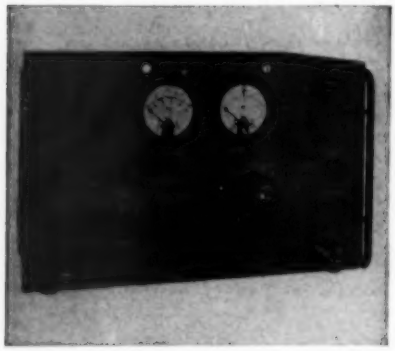
ROBINSON AVIATION INC.
TETERBORO, NEW JERSEY
Vibration Control Engineers
AIRBORNE DIVISION

West Coast Engineering Office: 3006 Wilshire Boulevard, Santa Monica, Calif.

New Products and Processes

VOR SIGNAL GENERATOR

Aircraft Radio Corp. began delivery last month of its new H-14A omnirange signal generator used to test airborne VOR receivers and to transmit signals to ground aircraft for ramp checks.



Major design improvements in the H-14A, ARC says, include: use of "reliable" tubes; introduction of a percent modulation meter; and, inclusion of identifier circuitry for superimposing 1,000 cps dashes on the navigation modulation when signals are transmitted to aircraft on the airport.

Circle No. 175 on Reader Service Card.

JET ANALYZER

New Model J Jetcal Analyzer built by B & H Instrument Co., Inc. predetermines the accuracy of jet engine exhaust gas temperature and tachometer systems in ground maintenance operations.

With the new tester, exhaust gas temperature thermocouple circuits can be checked to a ±4° accuracy without running the engine or disconnecting any wiring. A new "Takcal" unit for testing the aircraft tachometer system is said to be accurate within ±0.1% rpm.

Circle No. 176 on Reader Service Card.

CABLE CHECKER

Link Aviation, Inc. has announced development of the Model 209 automatic cable checker for laboratory and production line use in electrical continuity checks and for locating grounds or shorts.

Consisting of a master and slave unit, new Link tester provides 49 numerically and alphabetically labeled indicator lamps. A light on the master unit shows the wire and pin under test, while a corresponding light on the slave tester indicates the pin to which the opposite end of the wire is connected.

In operation, the master unit automatically scans until a connection is encountered then stops to show continuity or shorts and grounds where they exist.

Circle No. 177 on Reader Service Card.

VIBRATION ISOLATOR

New ALI-ANGL vibration isolator developed by Barry Control, Inc. for jet and missile installations is designed for use under conditions of violent maneuvering and high steady state acceleration.

New Barry design uses seven principal parts. Load is supported by two conical steel springs, while a split nylon washer between two steel washers provides vertical and lateral friction damping. Two molded nylon spring seats serve as top and bottom snubbing washers.

First unit, designated miniature Model B22-BB, is available in four spring stiffnesses covering loads from one-half to three pounds per mount. Production of isolators to handle nine pound loads is slated for this summer with 40-pound models to follow soon after.

Circle No. 178 on Reader Service Card.

SENSITIVE RELAY

New sub-miniature sensitive relay marketed by Price Electric Corp. for guided missile use will resist 30 g vibration up to 2,000 cycles when adjusted to 0.050 watts sensitivity, according to its producer. It is also said to withstand operating shock of 50 g for 0.011 seconds duration and mechanical shock of 2,000 ft. lbs. and 1,000 g rotary acceleration.

The Price Model 503 includes a set of single-pole, double-throw contacts rated at 0.5 amperes, 120 volts d-c inductive. Unit measures less than 2 in. in length and 13/32 in. square.

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THERE IS A REASON WHY!

DALLAS AIRMOTIVE OVERHAULS MORE AIRCRAFT ENGINES THAN ANY OTHER COMPANY IN THE WORLD

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ASSURED BY STRATOS
With Stratos pressurization and air conditioning equipment aboard, the passenger is assured a comfortable trip regardless of flight altitude or outside weather. And the airline knows that it will have no air conditioning worries.
Stratos cabin superchargers have approved operating periods of up to 2000 hours. With the world's leading airlines they have chalked up outstanding service records. Over 93% reach their approved operating time even in the summer months.
Stratos bootstrap air cycle refrigeration units, in actual service tests, have operated 3000 hours without any servicing other than periodic lubrication and be
STRATOS EQUIPMENT IS NOW IN USE BY:
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NORTHEAST AIRLINES
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Bootstrap Refrigeration Unit
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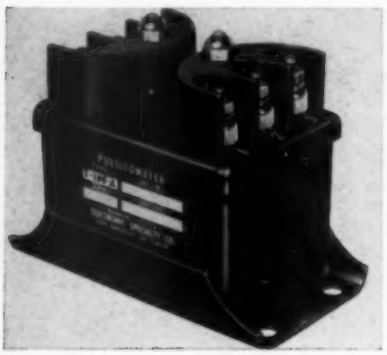
STRATOS
A DIVISION OF FAIRCHILD ENGINE & AIRPLANE CORP.
Main Office: Bay Shore, L.I., N.Y. • West Coast Office: 1355 Westwood Blvd., Los Angeles, Calif.

New Products

Position Flasher

New one-pound aircraft position light flasher marketed by Electronic Specialty Co. uses a resistance-capacitance network operating through relays to cycle lights at the rate of 40 flashes per minute. This approach,



manufacturer states, eliminates difficulties with motor driven switch type designs caused by shock and vibration.

ESC Model T-196A flasher is designed to meet Spec. MIL-F-7414. Dimensions are 4″ x 2⅛″ x 3¼″.

Circle No. 180 on Reader Service Card.

DISCONNECT VALVES

New line of quick-disconnect aircraft drop-tank valves introduced by Allen Aircraft Products, Inc. are designed for use with external wing tanks or bomb bay drop tanks.

Available in both right-angle and straight-through flow types, new Allen valves range in size from a ⅜″ type weighing only .343 lb. to a 2-in. valve weighing 2.56 lbs.

Circle No. 181 on Reader Service Card.

VHF TRANSMITTER

New 22-channel airborne VHF communications transmitter developed by Dayton Aviation Radio and Equipment Corp. weighs 1 lb., 6 oz., and covers the frequency range from 118.0 to 127.0 megacycles.

Unit is available with either local or electrically-operated remote channel selection. Dimensions are 2½″ x 3½″ x 7¾″.

Circle No. 182 on Reader Service Card.

TAB ACTUATOR

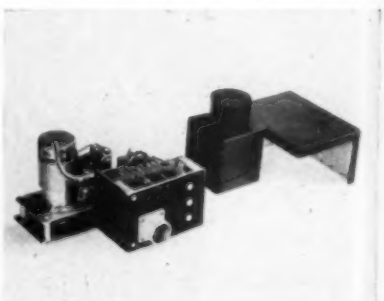
New electric motor driven elevator trim tab actuator unveiled by Lear, Inc. LearCal Div., weighs only 3.5 pounds and is available for either 12- or 24-volt operation.

The Lear Model 868-4 unit mounts in the manual trim tab control system and is operated by a finger-tip switch on the control wheel.

Circle No. 183 on Reader Service Card.

TUNING DRIVE AMPLIFIER

A miniaturized tuning drive amplifier for airborne communications equipment, that may be mounted directly on radio compass AN/ARN-6, is 60% lighter than previous equipment, ac-



cording to a North American Philips Co. announcement.

Known as ED-400, the unit occupies only 90 cubic inches, employs electronic switching in place of relays which according to Philips offers increased reliability, and is said to meet MIL-E-5400 and MIL-E-5272 specifications.

Circle No. 184 on Reader Service Card.

DISC CAPACITOR

Featuring temperature-capacitance stability within 9.8% average of nominal value from —55°C to +85°C,

WORTH INVESTIGATING!

Excellently located modern airport.
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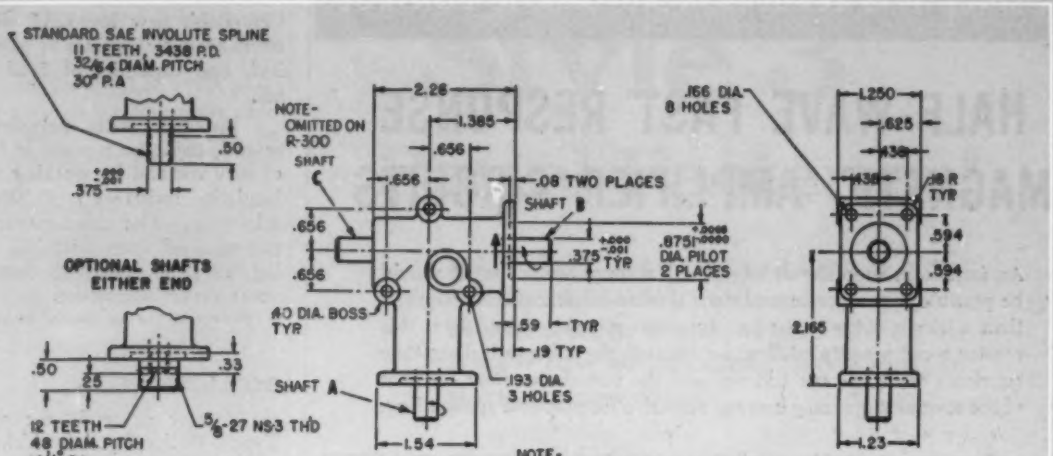

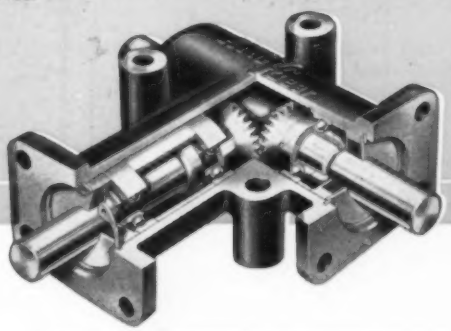

HOW TO MAKE A RIGHT-ANGLE BEVEL GEAR

Need a right-angle gear drive? You can make one yourself. Here's all you need: a set of Coniflex* gears, a precision-cast housing, antifriction bearings, and shaft extensions. Put these together, lubricate the unit for life, test it for quietness (noise means future trouble), and you have a right-angle drive. Too expensive, you say? That's why we would urge you to buy ANGLgear, a compact, standardized take-off that has won the respect of designers everywhere.

**Trade-mark The Gleason Works, Rochester, N.Y.*

Model & Type	Ratio Turns "A" to Turns "B"	HP Output	RPM Shaft "B"	Ultimate Static Torque (lb in)	Shaft dia (Inches)		WT (lb)
R-300 2-way	1:1	½	1800	450	⅜		½
R-300-2 2-way	2:1	½	1800	450	⅜		½
R-310 3-way	1:1	½	1800	450	⅜		½
R-310-2 3-way	2:1	½	1800	450	⅜		½
R-320 2-way	1:1	1	1800	1500	⅝		2.2
R-320-2 2-way	2:1	1	1800	1500	⅝		2.2
R-330 3-way	1:1	1	1800	1500	⅝		2.4
R-330-2 3-way	2:1	1	1800	1500	⅝		2.4

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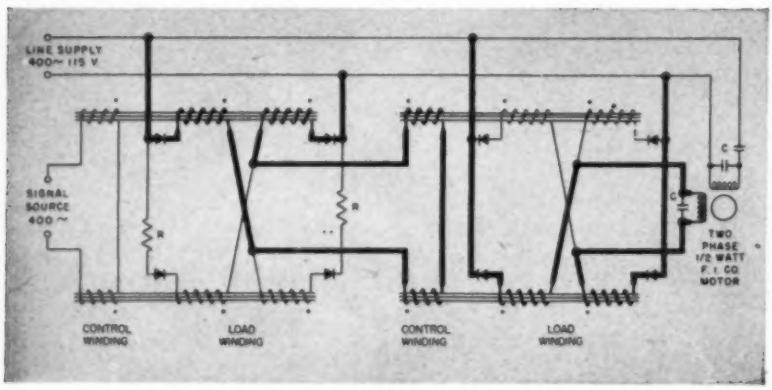
HALF-WAVE FAST RESPONSE MAGNETIC AMPLIFIER CIRCUITS

An important requisite of any practical amplifier is that it should be possible to cascade several units if more amplification is required than a single stage can offer. In usual magnetic amplifiers, this creates some practical difficulties because the inherently long time constants of each stage add up, and the cumulative time constant of the several stages may become excessive for practical applications.



Ford Instrument Company has perfected and holds the basic patents on circuits which allow cascading magnetic amplifiers with stages operating on successive half-cycles of the a-c supply.

In the circuit shown here, amplification in each stage of the amplifier is accomplished by pre-setting the core fluxes with the control-winding signal during one half-cycle of the applied load-winding voltage. During the next half-cycle, when the load-winding conducts, the control winding contribution is negligible. In this mode of operation the control winding of each stage of the amplifier receives its signal during the reset or non-conducting half-cycle of that stage of amplification. The effect of this signal occurs during the next half-cycle, thus the time constant in the stage is at a minimum of ½ cycle.

The amplifier uses half as many elements (cores and rectifiers) as the conventional bridge (full-wave circuit), and has a constantly higher figure of merit (power gain per cycle of time constant).

In amplification problems it will pay you to talk to the engineers of Ford Instrument Company. For forty years this company has specialized in designing and manufacturing special computers and controls. Send your problem to Ford.

57

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ENGINEERS
of unusual abilities can find a future at FORD INSTRUMENT COMPANY. Write for information.

Circle No. 21 on Reader Service Card.

New Products

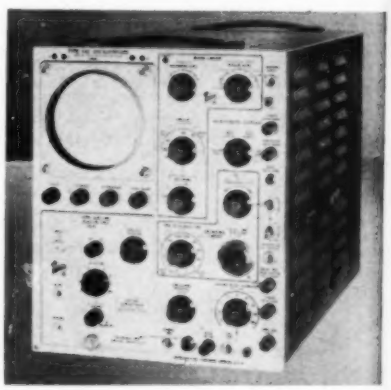
Centralab's new ISO-KAP disc capacitor is available in sizes of ½ and 11/16 inch and capacities of 5$\mu\mu$f to 0.0022 mf.

Insulated with polyethelene, the ceramic capacitor is rated at breakdown of 3000 vdc and for working at 500 vdc. Insulation resistance is 10,000 megohms minimum. The manufacturer claims exactness of sizes, identical lead spacing, and high lead pull strength as advantages to automation applications.

Circle No. 185 on Reader Service Card.

OSCILLOSCOPE

A new dc to 30 mc oscilloscope, Type 545 developed by Tektronis, has



in combination with Type 53K/54K Plug-In Pre-amplifier, a rated vertical-amplifier rise time of 12 millimicroseconds and passband of dc to 30 mc at calibrated sensitivities of 0.5 v/cm to 20 v/cm. A new crt gives 4 x 10 cm linear display. Sweep range is 0.1 μsec/cm to 5 sec/cm. Sweep-delay range is 1 μsec to 0.1 sec within 2%; incremental accuracy within 0.2% of full scale.

Circle No. 186 on Reader Service Card.

POWER SUPPLIES

A series of flexible power supplies, for experimental work on klystrons, traveling-wave tubes, and other microwave devices needing variable voltage supplies, have been announced by Levinthal Electronic Products, Inc.

Models of 1,000-volt to 50-kilovolt that operate from inputs of 105 to 125 volts, 60 cycle ac, are available; 1,000- and 2,000-volt models supply 200 ma with a rated regulation to a maximum of ½% over the ac input range, and a ripple of less than 0.5 volts peak-to-peak at any output. Metering with 1.0% accuracy is available. Units are interlock and automatic shorting device protected.

Circle No. 187 on Reader Service Card.

TRANSISTOR TESTER

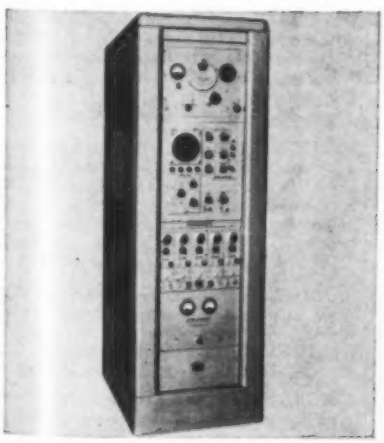
Measurements of transistor or diode parameters can be made with a new Transistor Tester, Model TT-11A, announced by Electronics Research Associates, Inc.

Characteristics of NPN, PNP, junction and point contact transistors, and other semi-conductor devices can be either measured or read on a "Go, No-Go" basis in both static and dynamic tests performed by means of a bridge comparison circuit in the tester. Results are claimed to be independent of voltage and temperature variations. An internal power supply is included for transistor biases of 0-10 ma for emitter current, and 0-10/100 volts for collector voltage.

Circle No. 188 on Reader Service Card.

MICROWAVE GENERATOR

New code modulated microwave generator with five pulse channels to provide modulated carrier from 950 to 10,750 mc for beacons, missiles, and radar. Each pulse channel has variable pulse width and delay. Repetition rate is variable.

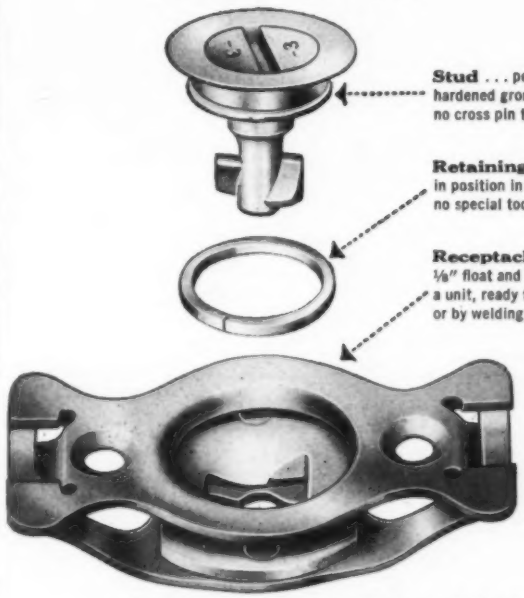


Produced by Polarad Electronics Corp., the generator has built in AC line voltage regulator. Instrument is rack mounted and has casters.

Circle No. 189 on Reader Service Card.

New "Style 3" Panel Fastener!

PANELOC introduces Light-Weight, All-Steel Model, Setting Superior Standards in Tension and Shear at a new low price! Only three simple parts to inventory.



Stud . . . permanently assembled to a hardened grommet, comes as one unit, no cross pin to loosen or fall out.

Retaining Ring . . . locks stud assembly in position in one simple operation with no special tools required.

Receptacle . . . all steel, with full 1/8" float and 1" rivet spacing. Comes as a unit, ready for mounting with two rivets or by welding.

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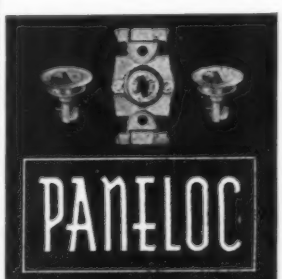
PANELOC...America's most versatile line of aircraft fasteners...includes Styles 1, 2 and 3 Panel Fasteners, High Performance Fasteners, Rotary Latches and Snap Fasteners.

Styles 1 & 2 | High Performance | Rotary Latch | Snap Fastener

Fill in Coupon or Write Letter for Catalogs



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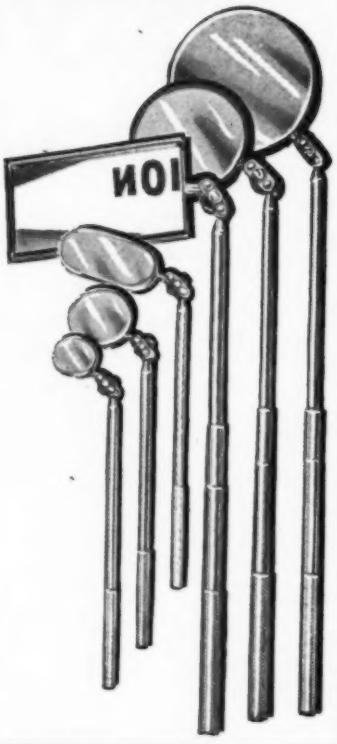

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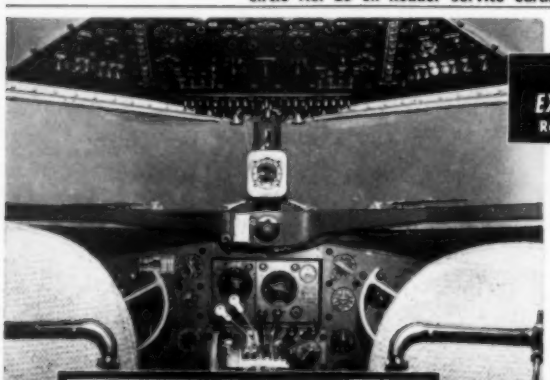

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L.B. Smith Aircraft Corporation, International Airport, Miami 48, Florida—Phone 64-0611

Circle No. 24 on Reader Service Card.

Technical Literature

VIBRATION SHOCK PROTECTION. New folio published by Robinson Aviation, Inc. describes its engineered mounting systems for protection of airborne electronic equipment.

Circle No. 150 on Reader Service Card.

AIRCRAFT SERVICE. Complete facilities of Spartan Aircraft Co. Aviation Service Div. are outlined in new 18-page booklet

Circle No. 151 on Reader Service Card.

HIGH TEMPERATURE WIRE. Booklet 19-594 available from General Electric Co. Wire and Cable Dept. lists specifications on new silicone rubber-insulated wire and cable.

Circle No. 152 on Reader Service Card.

COCOON DATA. Protective qualities of R. M. Hollingshead Corp.'s Cocoon sprayable plastic coatings are discussed in new 4-page service bulletin No. C-1.

Circle No. 153 on Reader Service Card.

PORTABLE X-RAY. New 4-page brochure describes North American Philips Co.'s Norelco MG-60 lightweight portable x-ray unit.

Circle No. 154 on Reader Service Card.

ELECTRICAL CONNECTORS. Joy Manufacturing Co. illustrates its new line of electrical connectors in 12-page bulletin No. B51.

Circle No. 155 on Reader Service Card.

FLOWCOAT FINISHING. Separate 8-page bulletins on dip tank and flowcoat finishing methods are available from E. I. Du Pont de Nemours & Co. Industrial Finishes Division.

Circle No. 156 on Reader Service Card.

SERVO MOTORS. Specifications on more than 130 synchros, servo motors and resolvers are listed in Bulletin No. 355 available from Norden-Ketay Corp.

Circle No. 157 on Reader Service Card.

AUTOMATION. "Opportunities Through Automation" is the title of a new 20-page booklet published by Ex-Cell-O Corp.

Circle No. 158 on Reader Service Card.

JET THERMOCOUPLES. Up-to-date information on its new line of aircraft jet engine thermocouples is contained in new brochure being distributed by Fenwal, Inc.

Circle No. 159 on Reader Service Card.

MICROPOSITIONERS. Bulletin F 3961-4 published by Barber-Colman Co. describes new ultra-sensitive polarized d-c relays for use in aircraft remote positioning, synchronization, temperature control, detection and amplification systems.

Circle No. 160 on Reader Service Card.

FACILITIES BOOKLET. Diverse activities of AC Spark Plug Division, General Motors Corp. in electronic, electro-mechanical and mechanical engineering, research and development are illustrated in new 16-page brochure.

Circle No. 161 on Reader Service Card.

JANITROL HEATERS. Basic principles of aircraft combustion heating systems are discussed and illustrated in new 54-page booklet available from Surface Combustion Corp.

Circle No. 162 on Reader Service Card.

LABELON TAPE. Use of new Labelon layout tape for plant facilities planning is described in new 8-page booklet by Labelon Tape Co.

Circle No. 163 on Reader Service Card.

PULSED OSCILLATORS. A four page application bulletin called "Pulse" covering possibilities of EIMAC tube performance in pulsed oscillator service for radar. Published by Eitel-McCullough, Inc.

Circle No. 164 on Reader Service Card.

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Today there are more F-86D Sabre Jets flying on active duty than all other interceptor-types combined. North American Sabre Jets are the winged backbone of our nation's continental defense system and the defense system of many of our allies throughout the world. Day or night, fair weather or foul . . . F-86D's are ever alert to intercept any possible invader.

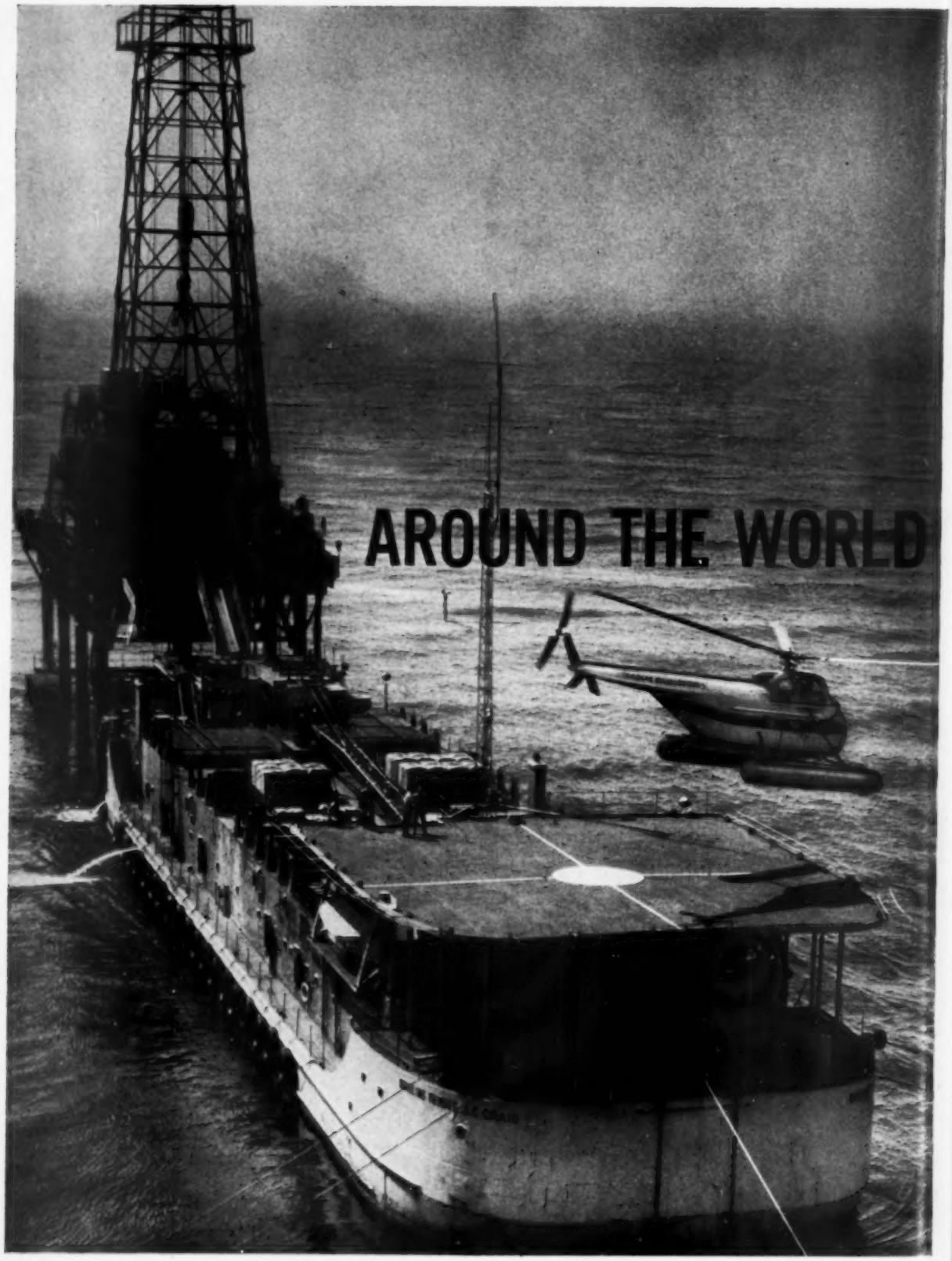
The "D" was the Air Force's first one-man all-weather interceptor. Capable of 650 m.p.h. plus speeds, it carries 24 Mighty Mouse rockets, each able to destroy any known type of bomber.

Latest in North American's famous Sabre family is the new F-86K, cannon-armed sister of the F-86D, which is now in production and will soon join NATO forces in Europe's air defense. Both the "D" and "K" are prime examples of North American Aviation's unsurpassed ability to design and produce the planes to meet America's defense needs.

Research and development keep North American foremost in aircraft, rocket engines, guided missiles, electronics and peaceful applications of atomic energy.

ENGINEERING AHEAD FOR A BETTER TOMORROW

NORTH AMERICAN AVIATION, INC.



GULF COAST—Specially designed float-type landing gear, pictured here, is now available for commercial Sikorsky S-55 helicopters regularly used to fly men and equipment between the mainland and oil well drilling rigs offshore. It weighs about the same as the wheel-type gear it replaces, which means S-55s so equipped can carry their normal large loads. These S-55s can land on water or marshes, on regular heliports, or on platforms at sea.

SOUTH AMERICA—Maps needed for civil development in South America will result from an Inter-American Geodetic Survey to be undertaken soon. Five U. S. Army Sikorsky H-19 helicopters will be used on the project. The big red and white Sikorskys will work in ten South American countries. Similar surveys in Alaska are planned.

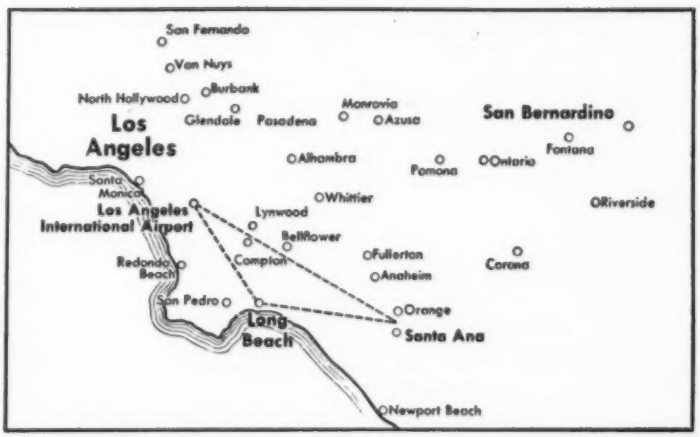
SWEDEN—In Stockholm, air experts from Finland watch Ostermans Aero, Ltd., a pioneer commercial helicopter operator, demonstrate rescue techniques with a big Sikorsky S-55 helicopter. Ostermans plans to begin helicopter passenger service soon between Malmo, Sweden, and Copenhagen, Denmark.

WITH SIKORSKY HELICOPTERS

HELICOPTER HISTORY:

Flotation Gear Pioneered by Sikorsky's VS-300

EARLIEST USE of flotation gear on helicopters was on Sikorsky's historic VS-300, the first successful American helicopter. This picture made at Stratford, Connecticut on April 17, 1941, shows Igor Sikorsky at the controls of the VS-300. It had three rubber floats. Later versions used two long floats, similar to those on today's S-55s.



CALIFORNIA—Los Angeles Airways' passenger service with Sikorsky S-55 helicopters now has been extended deeper into Southern California. A new route connects Santa Ana and Orange with Long Beach and the Los Angeles International Airport. Passenger service as far east as San Bernardino is planned by early summer, and to more than a score of other cities around Los Angeles (see map) by the year's end.

SIKORSKY AIRCRAFT
BRIDGEPORT, CONNECTICUT
One of the Divisions of United Aircraft Corporation

People

MANUFACTURING

Gordon T. Ersted joins AC Spark Plug Division of General Motors as military sales representative.

Nick Carter moves from sales engineer for Wright Aeronautical in Los Angeles to mgr. of Canadian office of Curtiss-Wright, Ltd.

N. D. Meadowcroft appointed eastern sales and service mgr. for Hardman Tool & Engineering Co.

Arthur C. Hartman appointed asst. plant mgr. of Aircraft Products Div. of Air Associates, Inc.; **Philip L. McGovern** appointed asst. controller.

Dr. E. R. Piore elected vice president of Avco Manufacturing Corp. and chairman of committee on advanced scientific research.

Donald H. Alder appointed mgr. field project engineering, western region of Robinson Aviation, Inc.

Summers Gyroscope Co. names the following vice presidents: **John W. Brubaker**, engineering; **Marvin B. Ruffin**, customer relations; **Jerome Domb**, manufacturing.

Jack Pyle, formerly with Summers Gyroscope Co., named sales engineer for California district, Carruthers & Fernandez, Inc.

John M. Rogers appointed west coast representative for Reaction Motors, Inc.

Eugene V. Myers named chief accountant for Dallas Aero Service.

Croydon H. Hartley appointed foreign activities director for Servomechanisms, Inc.; **John J. Dempsey** made mgr. of components division.

S. Merrill Skeist resigned as vice president-contracts of W. L. Maxson Corp.; will continue as consultant on special contract and sales problems.

ELLINGTON

BAIN

Ken Ellington elected vice president, Republic Aviation Corp.; **Walter G. Bain** v.p. and gen. mgr., elected to board of directors.

Ludwig T. Stoyke appointed mgr. of hydraulic engineering department, Lear-Romec Div. of Lear, Inc. **T. K. Greenlee** appointed engineering mgr. of Grand Rapids Div.

Lawrence J. Torn promoted to chief electronics control engineer, Airborne Instruments Laboratory, Inc.

Bendix Research Div., Bendix Aviation Corp., appointed **Ralph A. Lamm** to head special missile development activities and **Arthur C. Prine** assistant to the gen. mgr.

Robert A. Averitt appointed mgr. of Aviation Systems Engineering for General Electric Co.'s aviation and defense industries sales dept.

James W. Browder named technical asst. to Owen Olds, chief of electronics, Ryan Aeronautical Co.

William B. Bergen elected exec. vice president of The Glenn L. Martin Co.

Herbert Hopkins, former Air Force test pilot, joined North American Aviation as engineering test pilot.

James E. Bevins appointed asst. director of engineering of the Eclipse-Pioneer Div., Bendix Aviation Corp.

John Segrist, contract administrator for the Tulsa division, Douglas Aircraft Co., named asst. to the director of military relations for the corporation at Santa Monica.

Homer H. Evans, Jr., named advertising director, General Dynamics Corp.

AIRLINES

Ben Nicks named public relations representative for Trans World Airlines at TWA's overhaul base, Kansas City, Kans.

Michel de Villeneuve nominated executive v.p.-commercial for Air France.

James J. Bell appointed reservations mgr. for Trans World Airlines in Washington.

Oliver V. Mahan, Jr., named district sales manager for Northwest Airlines at New York.

Capt. Robert W. Jenkins named to new post of director of flight operations for Mohawk Airlines.

Douglas F. Bush named district sales manager of Airwork Atlantic, Ltd.'s Detroit office.

Charles Ammann named to newly created post of director of advanced process research, American Airlines.

AMMANN

John J. Lillis appointed Los Angeles district sales mgr. for Pan American World Airways.

Robert P. Brinkley named director of customer services for National Airlines.

Patrick H. Wildenberg made ground operations representative in Barranquilla, Colombia.

Frank Miranda appointed special representative for West Indies Sales Dept. in charge of Puerto Rican promotion for Eastern Air Lines.

MILITARY

Richard E. Horner from gen. engineer at Air Force Flight Test Center, Edwards AFB, to deputy for requirements to Trevor Gardner, Asst. Sec of the Air Force.

Maj. Gen. Dean C. Strother designated acting commander of the Air University, Maxwell AFB, Ala., replacing **Gen. Laurence S. Kuter**, reassigned as commandant of Far East Air Force.

Maj. Gen. Oliver S. Picher, former asst. for programming in the office of Deputy Chief of Staff for Operations, reassigned as deputy director for strategic plans of joint staff of the Joint Chiefs of Staff. Picher succeeded by **Maj. Gen. Daniel F. Callahan.**

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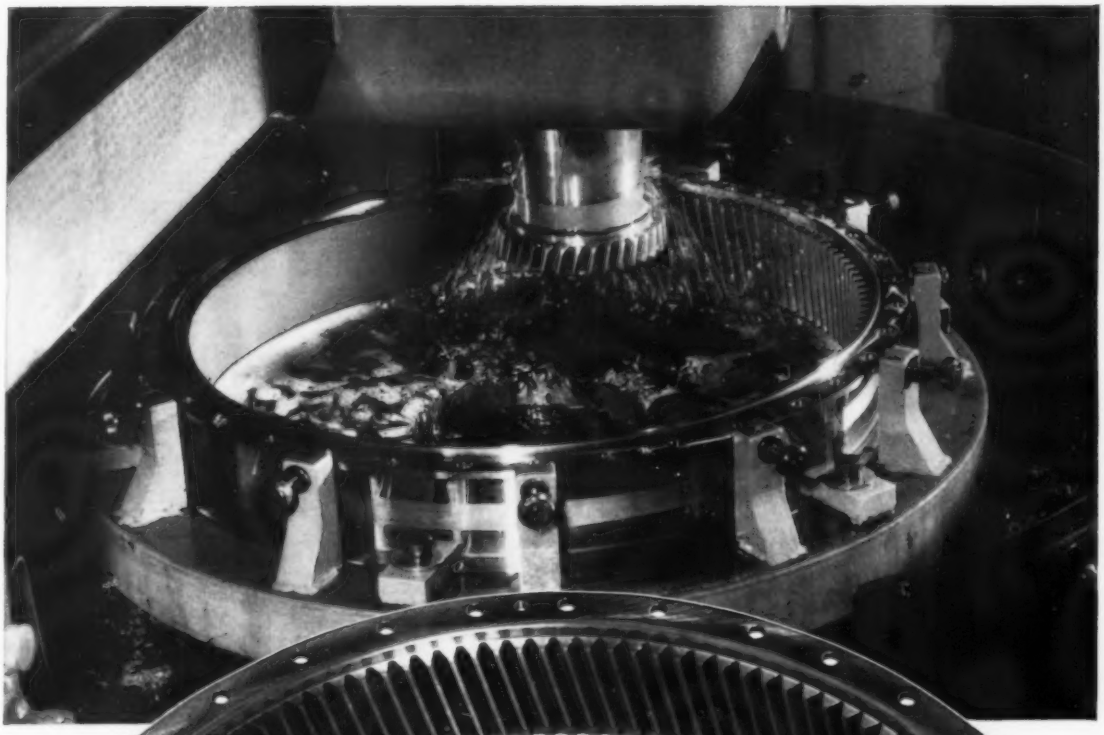

This 7 pitch, 19.1564″ pitch diameter internal gear for the Sikorsky S-58 Main Transmission

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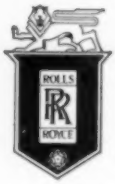

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Capital Airlines have ordered sixty Vickers Viscounts for domestic services in the U.S.A.

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propeller turbine engines

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Maintenance Bulletin Board

UAL Truck Saves Ramp Time

A new multi-purpose airport ramp vehicle developed by United Air Lines' engineers is cutting aircraft servicing time by as much as 50%. UAL is now operating six of the new trucks at San Francisco International Airport and plans to extend use to Chicago and other major cities.

New vehicle is designed for use with an underground gasoline supply system and is completely equipped for aircraft fueling. A 2" diameter hose, connected with a flow meter, attaches to the underground hydrant making the capacity of the trucks unlimited.

In addition to fueling, each truck carries tanks of oil, water and ADI (anti-detonant injection) fluid. These were formerly transported in separate carts and contributed to the maze of vehicles that surround aircraft during ramp operations.

Safety features on the UAL truck include three push buttons located at strategic points to permit shut-off of fuel flow in emergencies. As a further safeguard, the truck gears cannot be engaged until the fuel hose has been disconnected from the underground hydrant.

The tanks and truck superstructure were built to the airline's specifications by Industrial Steel Tank and Body Works located at Emeryville, Calif. They are mounted on a 1½-ton Chevrolet chassis.

NAL Adopts X-Ray Inspection

National Airlines now is using portable X-ray equipment as a pre-overhaul check tool to eliminate the time-consuming removal and re-installation of aircraft panels while conducting "hidden area" structural inspections.

Practice at NAL is to use the portable X-ray to check all major structural items before overhaul, examine the negatives, then prepare a worksheet before the plane actually enters the shop.

If the X-ray discloses no defects, the carrier dispenses with the usual uncovering of structural areas, an operation that consumed many man hours in past overhauls.

Should the X-ray negatives indicate corrosion or signs of failure, it is recorded on the worksheet prior to overhaul. This enables the mechanic to go directly to the work area under suspicion with specific instructions on the nature of problem needing correction.

X-ray device used by National is the Andrex model 165 KV manufactured in Denmark and distributed by Holger-Andreasen, San Francisco.

Braniff Tool Cuts Exhaust Stack Costs

Braniff Airways' sheet metal shop has come up with a simple shop tool that has tripled the service life of exhaust stacks used on Convair 340 aircraft.

Past experience at BNF showed that stack life averaged about 1200 hours in service and cost from $50 to $150 for replacement. Major problem was burning and erosion of the stack in the flange area.

Development of a simple sanding device, the idea of inspector Fred Symmank, has halted this trend and now permits average stack operation up to 3600 hours in service.

Tool developed by Symmank is a sander that re-surfaces the flange end of the stack without damaging the ⅜-inch extension that serves as a seal.

An old belt sander powered by a ¾ hp motor was modified to use a small drive belt, and a metal disc faced with a sanding disc that exactly fits the flange opening on the stack completed the design.

Now it is possible to sand out eroded and burned metal on exhaust flanges and to complete the entire operation on a stack in about three minutes.

New Device Speeds Northrop Parts Forming

Use of newly developed pressure plates in conjunction with Northrop Aircraft's new Verson-Wheeler high pressure hydro press is speeding fabrication of parts for U. S. Air Force's F-89D interceptors and Snark SM-62 pilotless bomber.

New plates are used with hydro form blocks to smooth out wrinkles caused in forming shrink flanges. Experience to date shows they eliminate from 50 to 100% of hand form bench time and save an average of four minutes time per part.

So far Northrop has fitted 43 form blocks with the new aid. Tooling time to produce a pressure plate is about one hour, whereas the shrink bar type previously used required 18 hours in fabrication.

Up front in the Turbo-Prop Race

Allison Model 501 for commercial use develops more power for its size and weight than any other Turbo-Prop engine built today

Pay-off on ten years of Turbo-Prop pioneering is the Allison Model 501 engine, commercial version of the T56 which recently completed the most exacting model test ever required of a propeller-type engine.

Now in production, this engine develops 3750 horsepower, or 2.3 horsepower per pound of weight—a power-to-weight factor better than any other Turbo-Prop engine available today, and almost 2½ times that of contemporary piston engines.

In a typical application, the Allison "501" saves one ton of weight per engine nacelle, and has an engine frontal area of only six square feet—less than half the frontal area of a reciprocating engine with comparable power. Its amazing compactness cuts speed-reducing nacelle drag as much as 60%.

These advantages will enable cargo transports powered with these engines to carry heavier payloads faster at far less cost than present aircraft.

And in passenger operation, smooth-running Allison Turbo-Props will provide quieter, more comfortable flights—and permit speeds better than 7 miles a minute.

Allison Turbo-Props are engines *in being*—not merely on paper. They are the first American Turbo-Props being built and delivered in production quantities, and have to their credit more actual flight experience than all other U.S. Turbo-Props combined.

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International Aviation

By Anthony Vandyk

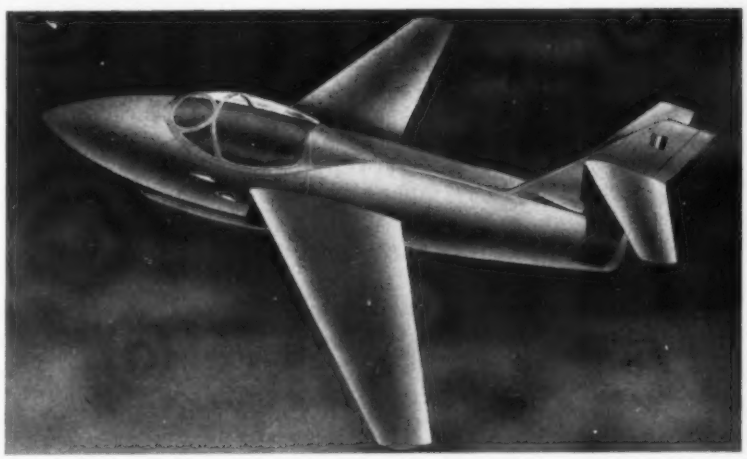
The equipment battle of the Atlantic became more heated this month with the introduction by Pan American of the DC-7B between New York and Paris. This is the first of the DC-7 series to be used on the transatlantic run and undoubtedly it will capture the blue riband of the air. The PAA DC-7Bs are scheduled to fly nonstop to Paris in 11 hours. They are operated as all-tourist aircraft. Thus, the passenger who wants to reach Paris the quickest travels on the tourist DC-7B rather than on PAA's first-class Super Stratocruiser which makes the flight non-stop but takes 12 hours 45 minutes (scheduled time) to do it.

This month also sees the entry on the Atlantic run of the L-1049G Super Constellation. This latest Connie is operated not by TWA, which has been mainly responsible for publicizing it in recent weeks, but by Deutsche Lufthansa. The German airline will use tiptanks to make fullest use of the Super Connie's range capabilities.

TWA this summer still will be operating L-749 Constellations on all its transatlantic flights and thus will be at a competitive disadvantage with several other airlines in terms of speed and nonstop operations. Nevertheless, the company undoubtedly attracts many passengers by its refusal to go in for combination-class cabin configurations.

BOAC has one-class accommodations on all transatlantic flights to the U. S. and Canada but on the weekly service from London to Bermuda and the Eastern Caribbean it will soon introduce combination-class Stratocruisers; this will be the first time that BOAC has used mixed-class aircraft. The British airline should do particularly well this summer since it will be the only operator of tourist-class Stratocruisers between Europe and North America.

The other airlines flying the Atlantic are using much the same equipment as they did last summer. The four DC-6B operators are LAI, Sabena, SAS and Swissair; KLM flies DC-6Bs and DC-6s to Montreal but the New York flights are operated with Super Constellations supplemented by a few L-749 Connie schedules. Air France likewise uses Super Connies as its standard transatlantic equipment and also has a few L-749 flights. El Al continues to operate early-model Connies while Iberia flies Super Connies to New York. Loftleidir is the only transatlantic operator of DC-4s out of New York. TCA flies Super Connies between Montreal and Europe.



ITALY'S FIAT G.91 lightweight fighter is being sponsored by the United States. Three prototypes and 27 additional aircraft have been ordered. Powerplant is the Bristol Orpheus and first prototype is in an advanced stage of construction. The above illustration was made by AMERICAN AVIATION's artist.

Vickers Chief Boosts BLC for Transports

British interest in flap-ejection boundary layer control was pointed up recently by Vickers-Armstrongs' George R. Edwards. He said that ejection of air over slotted flaps could give up to 10% increase in airliner economy when operating under airfield limiting conditions. The head of Vickers' aircraft activities acknowledged that the system is being investigated for the civil version of the Vickers V.1000 jet transport and the V.870 Viscount replacement.

An obvious feature in common with these two airplanes and the later Bristol Britannias is that their new powerplants, the Rolls-Royce Conway, Rolls-Royce RB-109 and the Bristol BE-25, are capable of handling much larger air masses than current turbines.

British observers believe that the key to successful (i.e. economical) flap blowing may lie in the new generation of turbines. In particular, the constant power BE-25 (torque-limited to 4,000 shp and with a sea level potential of over 7,000 shp) will have perhaps 50% surplus turbine energy for supplying compressed air at take-off without thrust loss—even more so when landing. The bypass Conway could also probably be adapted to BLC without undue thrust loss. Alternative sources of BLC air exist in the U. K. in the form of the Napier Oryx 750-ghp gas turbo-generator and its higher-power successor now under development.

Transport Briefs

Thai Airways has sold the two Super Constellations it had on order to **Qantas Empire Airways**; this will increase QEA's Super Connie fleet to 14 aircraft . . . **British European Airways** has ordered a third Westland-Sikorsky S-55 helicopter for delivery in July . . . **Ostermans Aero**, Swedish operator, will start scheduled S-55 helicopter service between Malmo and Copenhagen in the middle of the month.

Loftleidir, Icelandic non-IATA operator, has extended its cut-rate transatlantic service to Luxembourg; it charges $281.50 one-way and $507.10 roundtrip against the IATA New York-Luxembourg fares (tourist, on-season) of $315.20 and $562.50, respectively . . . **Sabena** Belgian World Airlines has purchased a Convair 240 from The Texas Company and is shopping for more; the carrier is currently evaluating the relative merits of the Sikorsky S-58 and the Piasecki H-21.

Iberia is likely to buy two more Super Connies to supplement the three it currently operates; the merger of the principal Spanish airline with **Aviacion y Comercio**, independent operator, is moving toward realization . . . **KLM** Royal Dutch Airlines made a profit of $2,700,000 in 1954; the company intends to buy back about half of the 95% of its shares held by the Dutch government and to re-sell them on the stock market.

Manufacturing Briefs

Holland's **Aviolanda** company has developed a pilotless target and liaison aircraft made of plastic and powered by a SNECMA pulse-jet of 180 lbs. thrust . . . First pre-production **Fiat G.82** has started its flight test program; during an official demonstration the Italian plane flew at 640 mph at 20,000 feet.

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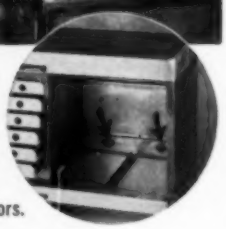

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West Coast Talk... By Fred S. Hunter

- **Lockheed has a new radar picket plane on boards**
- **Convair coming out with jet transport proposal?**
- **Ramjets stop phone conversation at Marquardt**

DISCLOSURE of Lockheed's WV-X, which, they say, will be equivalent to taking a radar ground station aloft, starts up a new guessing contest.

Burt Monesmith, California division g.m., merely noted, at the company's annual meeting, that it's projected, meaning it is down the road aways. Probably 1957. So . . . will it have the new or the old Connie wing? Will it be turboprop? Or might it have the present four Wright turbo compounds—for fuel economy at cruise—augmented by a pair of jet pods—like the P2V-7s—for boost up to 35,000 feet or thereabouts whenever maximum radar performance is desired? We wouldn't know, really, but for a guess we'd say the pod idea looks logical.

One thing for sure, though. It will have the Connie triple tail. That's essential for these big, bulging search jobs. You may not care for the triple tail for a transport design, but, brother, has it paid off for Lockheed on the radar plane! Today, these military adaptations from the Constellation represent nearly the biggest, if not the biggest, piece of business in the Lockheed shop.

• •

Much industry comment over the personal appearance of Harlow Curtice, General Motors president, at an Allison turboprop transport conference at Indianapolis attended by Capt. Eddie Rickenbacker of Eastern Air Lines, Arthur E. Raymond of Douglas and Hall L. Hibbard of Lockheed. His pitch for the 501D10 (Commercial version of the T56A1) left no doubt that Allison has all the weight of the parent company behind its commercial turboprop program.

• •

Nobody seems to give much thought to Convair for a turbojet transport. Why not? It looks like the Convair Dart turboprop is out the window. Indications are the Air Force will keep Boeing busy for a while on the KC-135 tanker. Lockheed's apparently going the turboprop route, and its Phase 1 jet tanker design study will be paced strictly by the Air Force. There isn't much doubt Douglas would prefer to build the DC-8 before it gets into a turboprop, but don't think for a minute it will turn down the order if its Model 1885 turboprop happens to be the one catching the fancy of American and Eastern.

The closer AA gets to a turboprop the closer TWA and United will be to checking on possible turbojet delivery dates. Convair might be in a good spot. Don't forget it had a design in the Air Force's jet tanker competition, which it can dust off to start on. And it has J57 experience with its F-102. Might just figure.

• •

Steve Stimpson, who gained a place for himself in air transport history 25 years ago when he hired the first airline stewardess, has a new definition right out of his own private dictionary.

"A stewardess is a girl who asks you what you want," says Steve, "and then straps you in so you can't get it."

Steve is now a cargo sales representative of United Air Lines in Los Angeles. He's still pioneering—seeking out new things to ship by air.

• •

Stan Shatto, Western Air Lines' v.p. of operations, still feels the first turbine-powered transport of U. S. manufacture to go into service on a domestic route will be a turbojet, not a turboprop.

• •

All phone conversations at Marquardt stop right there whenever a test run on a ramjet starts up. Nobody can hear a word on either end of the line . . . The 14-karat gold wire loftsmen load into automatic pencils to draw lines on lacquered master layout plates costs only 84¢ an inch, and wears down so slowly an inch lasts a year.

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Induction Motor – 400 cps, 115 volts	
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Nebraska Hangar Financing Plan Boosts Sales of Private Aircraft

Nebraska Aeronautics Department has come forth with a solution to the shortage of hangar facilities in the state. The problem has been a serious one and has been closely followed by the National Aviation Trades Association. The lack of proper plane storage facilities has been established as a definite deterrent to aircraft sales.

The Nebraska experiment, begun last year, has already resulted in plane ownership increases of 20% to 300% in towns where it has been put into effect. It consists of the aeronautics department participating in "T" hangar construction and shop hangar construction up to 80% of the actual cost.

The program was put into effect after a study by the department, James D. Ramsey, aeronautics director, told AMERICAN AVIATION. The study found the following conditions existed:

• **Potential aircraft** purchaser was deterred from such a purchase because he did not want the plane tied down outside; money required to build a suitable hangar was uneconomical for him; and he did not want to construct a building on publicly owned land.

• **Individual cities** did not have adequate funds for hangar construction, although aware of the need for such work.

• **Funds were unavailable** either because the city could not legally borrow the money and/or there were no private agencies willing to make the necessary funds available.

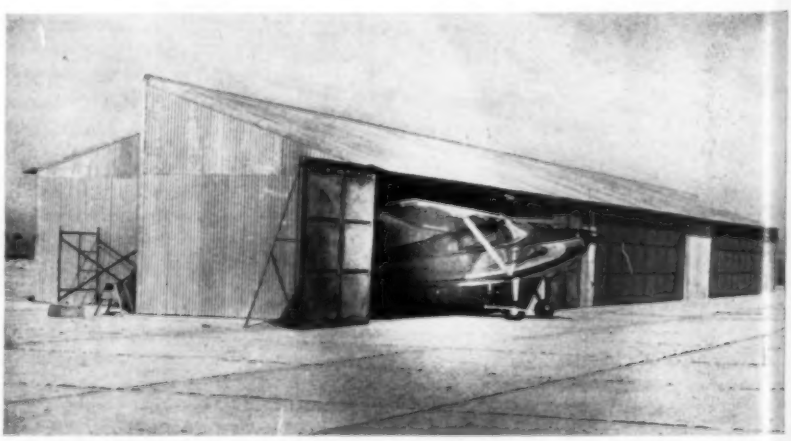
"We were convinced by our investigations with individuals in various communities," Ramsey stated, "that if reasonable storage space was available, airplane sales would materialize. Therefore we reviewed what possible steps could be taken to solve the problem. It was finally decided that one solution would be for the state to build hangars on municipal airports and for the cities involved to purchase such hangars within a period of ten years, making periodic payments from revenues received from the rental of such hangars."

Here's how the program was set up:

A revolving fund of $50,000 was established by the aeronautics department, participating in "T" hangar construction up to $1500 per stall or 80% of actual cost (whichever is lesser) and in shop hangar construction up to $4.00 per square foot or 80% of actual cost. Individual cities put up 20%, but this does not have to be cash—it can be labor and/or materials also.

The cities pay monthly rentals calculated to return the state's investment in ten years, with the state retaining title until paid up. The city may complete payment for the hangars at any time. If they complete payment within five years they receive a 5% reduction.

• **A survey of various** "T" hangars available "led us to believe that the costs were too high," Ramsey observed. "Therefore, together with several steel companies we designed a hangar that we felt was suitable and yet was approximately $1000 per stall under the average market price. This priced hangar would make it possible for the city



LOW-COST "T" hangar was designed by the Nebraska Aeronautics Department in consultation with several steel companies as part of its hangar aid experiment, in order to make it possible for a city charging only $10 to $15 per month per stall to operate, maintain and completely pay off the hangar to the state within 10 years.

charging only $10 to $15 per month per stall to operate, maintain and completely pay off the hangar within ten years."

The state-designed unit, however, is optional. The city may take other types if it so desires within the limits of the aid program. The state does not control rental charges, either.

Nebraska so far has concluded agreements with ten cities for the construction of 41 "T" hangars and five shop facilities, with construction already completed on 24 "Ts" and two shops at six of the cities. The balance are expected to be ready by the end of June.

• • •

U. S. Steel Buys Vickers Viscounts

U. S. Steel Corp. has become the first U. S. purchaser of the Vickers Viscount 700D executive turboprop transport, ordering three aircraft for 1956 delivery.

Company order, a spokesman said, is in keeping with Capital Airlines' decision to re-equip its fleet with Viscounts. USS' Super DC-3s, which form the backbone of its present executive aircraft fleet, are operated and maintained by Capital.

Executive Viscount, Vickers says, is designed to meet the needs of individuals and corporations requiring the most modern of 4-engine pressurized turboprop transports.

New model is fitted with "ultra-long range" wing slipper tanks plus extra tankage under the fuselage floor to provide a maximum range of 2,500 nautical miles.

April Utility Plane Shipments Total 426

Seven aircraft manufacturers shipped a total 426 one- to ten-place aircraft during April, 1955, according to Aircraft Industries Association.

Deliveries included 366 planes of 4-place or more and 60 one- and two-place aircraft. Total value of shipments was $6,459,000.

New Texas Service

Dallas Aero Service of Love Field has been designated an authorized factory service organization for the Aero Commander, the first in Texas. It will provide maintenance, service and overhaul for both the airframe and Lycoming 260 hp engine. Dallas Aero technicians were trained by representatives of the Aero Design and Engineering Co.

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How to Finance Airport Improvements

(Editor's Note: AMERICAN AVIATION presents the following story on a unique revenue bond plan for financing airport construction as an example of how private funds can be raised for much needed work when necessary.)

By RICHARD E. MOONEY
Airport Manager, Smith Reynolds Airport
Secretary-Treasurer, Airport Commission, Forsyth County

GROUND was recently broken for a new hangar and office building at the Smith Reynolds Airport, Winston-Salem, N. C. for Piedmont Airlines. The significance of the project is not that it was undertaken, however, but in its financing. Revenue bonds were sold under special enabling legislation, with the sole guarantee Piedmont's lease on the property.

The cost of the subject project was estimated in the neighborhood of $900,000. A bond issue was determined to be the most desirable as well as feasible method of financing. General obligation bonds, pledging the full faith and credit of Forsyth County, were ruled out due to North Carolina state law, which requires that such an issue be authorized only after a favorable referendum vote.

An alternative was the revenue bond, a relatively new but promising method of financing airport improvements. Its primary advantage stems from the fact that only the revenues to be derived from the airport facility need be pledged. This would put the project on a self-supporting basis, with no possibility of falling back on the taxpayer should revenues received from its rental be insufficient.

• **A special act,** amending the North Carolina Revenue Bond Act of 1938, permitting the sale of revenue bonds to finance airport improvements, was passed by the State Legislature in 1953. This amendment was drafted with the aid of Reed, Hoyt, Taylor & Washburn, New York bond attorneys, who later passed on the legality of the bond issue.

The next step was to issue revenue bonds which would be attractive on the bond market. One of the primary considerations in achieving this was to keep in mind that "the ability to issue airport revenue bonds depends primarily on the earning power of the facilities whose revenues are to be pledged." Other good rules of practice for increasing the marketability of revenue bonds:

(1) place on sale issues for not less than $1,000,000;

(2) spread the risk;

(3) pledge revenues beyond those to be obtained from rental income of the project for which the bonds are being issued;

(4) establish sound base contracts with financially competent tenants for a period long enough to retire the bonds;

(5) engage the services of a consultant acceptable to investment firms for the preparation of the feasibility report;

(6) figure annual rental on a basis of approximately 150% of debt service requirements until bonds are retired;

(7) obtain a recognized firm of bond attorneys to pass on the legality of the issue.

All of these requirements were not economically feasible to meet. We did not need $1,000,000; the risk could not be spread because there was only one proposed tenant, and the possibility of the single tenant, Piedmont Airlines, being able to pay a rental equal to 150% of the annual debt service was out of the question.

The project was undertaken with no municipal funds, additional airport revenues, or multiple tenants; only the full faith and credit of Piedmont Airlines. This recently proved sufficient, when investors purchased $925,000 worth of Forsyth County revenue bonds for "airport improvements."

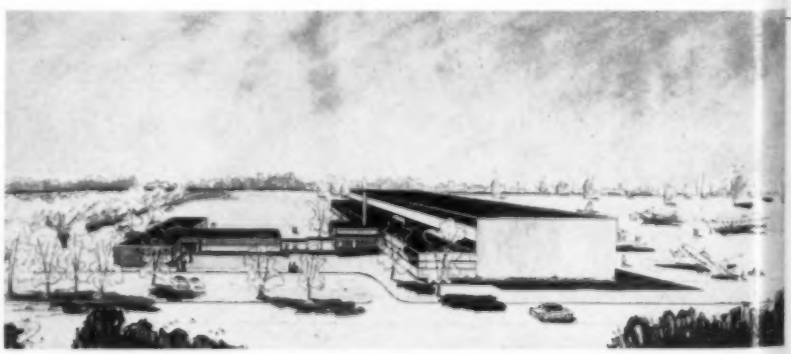
• **The bonds sold** March 1, 1955, are "special obligations (revenue) of Forsyth County, North Carolina, payable solely from the revenues to be derived from rental charges collected by the County from renting or leasing the Project, or portions thereof, to produce an amount sufficient to pay all operating expenses and 120% of the maximum annual requirements for principal and interest."

All bonds will be retired by 1975 (20-year period) with a call feature which permits bonds payable subsequent to January 1, 1962, to be redeemed prior to their respective maturities, at the option of the County, on January 1, 1962, or on any subsequent interest payment date.

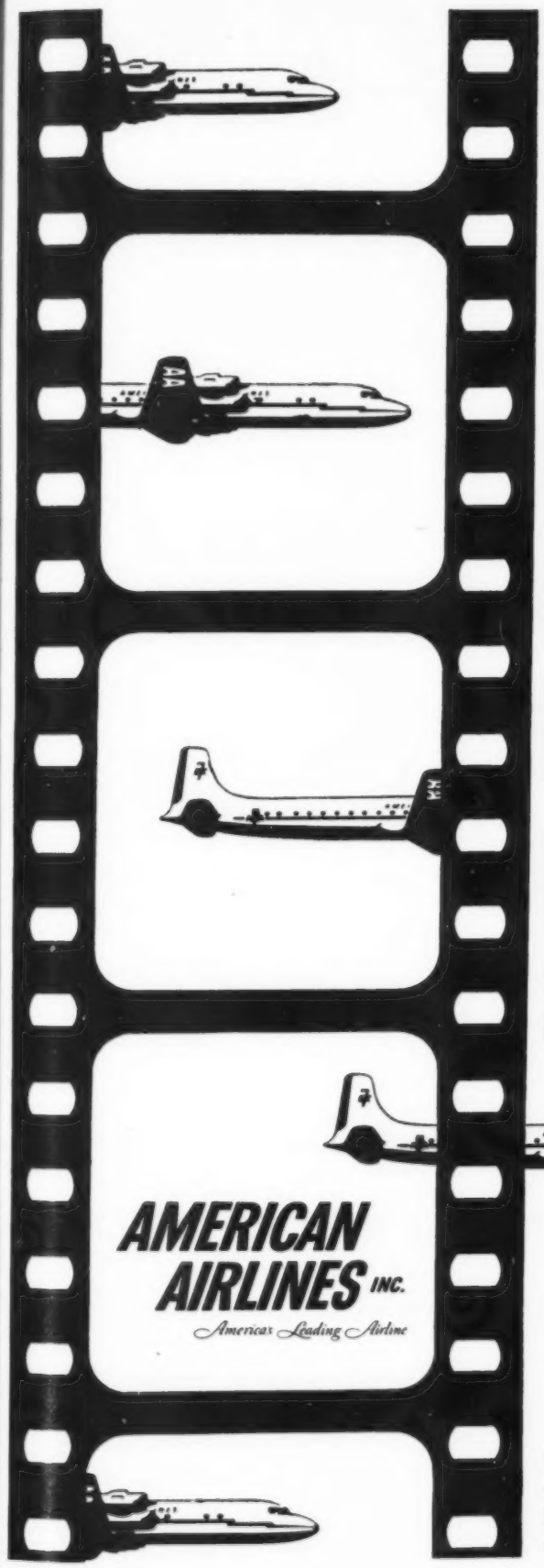
Cost of the project to be financed from the $925,000 may be roughly broken down as follows: land and construction contracts, $806,740; services, interest during construction and contingencies, $118,260. When sold, the proceeds from the issue (after the payment of all expenses necessary to the issuance of these bonds) were deposited in the "Construction Fund." Project costs will be paid from this fund.

All revenues as collected will be deposited in the "Revenue Fund" and withdrawn as required to make payments for operating expenses, immediate principal and interest requirements, to maintain a General Reserve Fund and to maintain a Debt Service Reserve Fund equal to maximum annual debt service due in any succeeding year. All monies remaining after these payments will be deposited in the Bond Redemption Fund, to provide for retirement of bonds prior to maturity.

The rental agreement entered into between Forsyth County and Piedmont Airlines is for a period of 20 years, with Piedmont given the option of renewal for an additional 20 years. Forsyth County will realize a net income from this project after redemption of all outstanding bonds. • • •



PIEDMONT'S new office building and hangar have been designed as two separate buildings connected by an 85-foot breezeway, and were found to cost no more per square foot to build than the more conventional hangar with lean-to attachment for offices. New design provides for (1) future expansion; (2) reduced fire insurance on office building; (3) removal of office from noisy airplane shop; (4) permit functional office layout rather than having to conform to space available in lean-to.



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TRANSPORT TRENDS

Washington, D. C., June 6, 1955.

SENATE COMMERCE COMMITTEE PLANS no hearings this session on the Administration's transportation program introduced by Senators Smathers, Magnuson and Bricker as an omnibus bill. Program resulted from the recommendations of the President's Cabinet Committee on Transportation Policy headed by Commerce Secretary Sinclair Weeks.

Reasons cited for the delayed handling are lateness of the present session and the controversial nature of the Administration's bill. During a recent committee executive session sentiment opposed its consideration this year and no known attempt has been made by committee members to obtain early action.

COMPLETE SILENCE BY THE ADMINISTRATION this year on much-discussed federal airways' user charges can be explained. Report is that President's highway program, which proposed a fuel tax to offset costs, was being used as a "trial balloon" to get reaction of Congress before submitting a similar airways' plan. Defeat of the highway bill may force Commerce Department to scrap its plan to propose an avgas tax to offset airways' operation costs.

ALTHOUGH CONTINENTAL AIRLINES is showing interest in the Viscount 800 turboprop, the airline isn't about to place an order, contrary to London newspaper reports. CAL president Robert Six, who recently returned from England, plans another visit in late summer.

A SIGNIFICANT CHANGE in the South Atlantic fare structure of International Air Transport Association member carriers went into effect June 1. It provides that airlines flying L-49 Constellations, DC-4s and DC-6s can charge lower fares than those operating more modern aircraft.

Under new structure, fares on Panair do Brasil L-49s or Aerolineas Argentinas' DC-6s operating between Europe and South America will be about 15% less than those of Air France, Alitalia, KLM, SAS and Swissair operating DC-6Bs or Super Constellations. DC-4 flights of Iberia are allowed a 30% discount.

MODIFICATIONS TO THE U.S.—U.K. bilateral air transport agreement route annex were agreed upon recently. Changes provide for a "polar" route between the two countries and the authorization of a U.S. carrier to provide New York-Nassau service.

Until now, only U.S. carrier affected is Pan American. Last month PAA filed application with CAB for a "polar" route from the west coast to three European terminals—Oslo, London, and Paris. Its application for New York-Nassau operation was filed in February.

EASTERN AIR LINES IS IN THE MARKET for 80 to 100 four-engine turboprop transports for delivery in late 1958 or early 1959. EAL specification is similar to that of American Airlines and both Douglas and Lockheed have submitted proposals.

Lockheed proposal is designated the Model CL-310 and includes two high-wing designs and one low-wing model. All will cruise at close to 440 mph and gross weight will be just under 100,000 pounds. Engines are Allison Model 501 recently certificated by CAA.

AIR FRANCE'S BOARD OF DIRECTORS has decided to order 12 Lockheed L-1649 Super Constellations, becoming the second commercial operator of the new, thin-wing version of the Super Connie.

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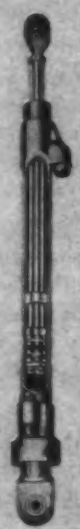

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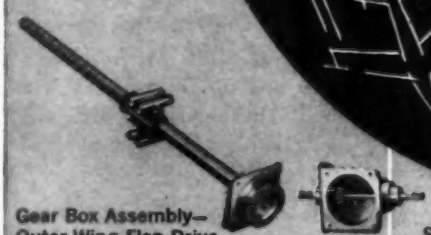

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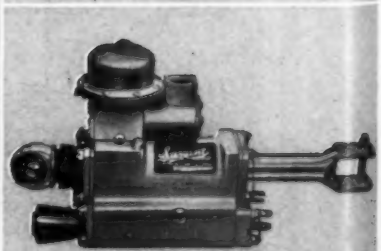

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Increased Traffic, Revenues Boost Prospects For New Airline Routes Throughout Country

By WILLIAM V. HENZEY

The current traffic and financial boom of the nation's airlines can and will lead to many new developments, but none appears more certain at this point than the likelihood of numerous new airline routes throughout the country.

As if by preconceived timing, although it is largely coincidence, many of Civil Aeronautics Board's big route cases are nearing completion at a time of relative prosperity, which lends itself to new route grants.

Carriers who were not in too strong a position to take on extensive new route mileage a year or two ago, now are looking for ways and means of spreading their operations.

Others, who for years have sought to complement their systems with certain apparently advantageous new route segments, now find their arguments enhanced as those segments are crying out for more service.

• **CAB members,** inclined to frown on additional competition in hard times, can be expected to react, to a large extent, in opposite fashion in good times.

In short, transport aviation appears definitely headed for a new era of route expansion subject only to the limitations which CAB chooses to impose. In this regard, arguing for a liberal Board policy are these factors:

• A majority, if not the entire Board, is impressed with industry earnings in 1955 and the feeling persists that competition can be stepped up in various areas.

• Two-thirds of the domestic trunk industry is now off subsidy and the granting of "reward" routes is considered in some high CAB circles as one method of insuring continued self-sufficiency.

• There is growing support for the theory that the quickest road to self-sufficiency for some subsidized carriers is to give them access to bigger markets. (The New York-Florida Case, in which Northeast Airlines seeks extension to Florida, is a significant test in this regard.)

• CAB, with four ex-members of Congress, is especially sensitive these days to Congress' desires and with subsidy demands decreasing Congress seems all for spreading aviation around a bit.

On the conservative side, however, is deep-rooted industry feeling that CAB should not close its eyes to the rapidity with which the airline financial picture has been known to change. The route structure of tomorrow, the argument goes, should be such that the industry can maintain it in good or bad times on a self-sufficient basis.

• **In its arguments** that resulted in defeat of a user charge program which some elements of the Government sought to impose on the airlines last year, CAB itself emphasized the need for taking the "long look" at airline finances as contrasted with judging the industry on either its boom or bust characteristics.

The same theory was expressed by the Board in connection with airline desires for fare adjustments during the 1951-54 period when earnings were rising less rapidly than expenses. Said CAB, in effect, "the industry cannot be judged on short-range results."

Thus, while the times would appear to dictate a liberal CAB policy, the Board, with more experience under its belt since the last route expansion period (immediately after World War II), can be expected to weigh heavily each new route mile doled out.

• **It has become** clearly established that airlines make money on certain heavy traffic routes and thereby support services to less lucrative markets.

One high CAB official hints that future Board policy may turn on that theory. The weak may be made stronger by new access to good markets while the strong may be asked to spread their operations to areas not now considered in the "lucrative market" class.

As to making the weak stronger by giving access to high density routes, there are thories galore in and out of CAB as to whether new competition on a route results in more people traveling by air or merely divides the same amount of traffic between the original carrier or carriers and the new competitor. The carrier seeking the route argues the former, the carrier possessing the route argues the latter.

However, if present traffic trends continue—traffic this year is running some 40% better than last year—economic theories undoubtedly will give way to the simple logic of public demand tempered only by CAB's knowledge of the industry's in-and-out financial record.

An insight as to just where the industry may go route-wise may be seen in the positions stated by the CAB staff and one of its Examiners in the

VARIG AIRLINES of Brazil has taken delivery on this Lockheed Super-G Constellation which will be used in service between New York and Buenos Aires, via Trujillo City, Rio de Janeiro, Belem, Sao Paulo and Montevideo. The Super-G is powered by four Wright Turbo Compound engines.

three most advanced of the major cases (New York-Chicago, Denver Service, and Northeast-Southwest cases):

AMERICAN—Its Routes 7 and 25 would be extended from Chicago to Los Angeles, Oakland, and San Francisco permitting new nonstop services. Its Route 4 would be amended to include a new Nashville-Boston segment, most important feature from AA's viewpoint being the inclusion of first-time service to Pittsburgh.

BRANIFF—Though an applicant in all three cases, no new routes are recommended by Board personnel.

CAPITAL—Its Detroit-New York route would be amended to include Buffalo, Rochester, and Syracuse as new intermediates. Also, existing restrictions on service between New York-Chicago, New York-Detroit, and New York-Pittsburgh would be removed. In the south, Route 51 would be extended beyond Asheville to New Orleans permitting new direct operations between northeast and Georgia, Alabama, Louisiana area.

COLONIAL—An applicant only in the New York-Chicago Case, it is not recommended for any new routes. CAI is also involved in the New York-Florida Case, but is preoccupied at this time with a merger into Eastern.

CONTINENTAL—An applicant in only one of the three cases, and not recommended for a new route in that.

DELTA-C&S—It would be granted a new San Antonio-New York route via Austin, Houston, Alexandria, Shreveport, Monroe, Memphis, Nashville, Knoxville, and Washington.

EASTERN—It would be placed in the Dallas/Fort Worth-New York market in competition with American, through extension of its Route 5 beyond Houston to Dallas/Fort Worth. Also, various restrictions on service to Pittsburgh would be removed or modified. EAL also has revived its bid for a southern transcontinental route (Florida-California) but there is no decision yet as to when the application will be tried.

NATIONAL—An applicant in two of the three big cases, but no new routes recommended by CAB personnel.

NORTHWEST—Its long-sought effort to operate direct between Chicago and New York is supported by Examiner William F. Cusick who recommends amendment of Route 3 to include Chicago as an intermediate between Milwaukee and Detroit.

NORTHEAST—As previously stated, its fortunes appear tied up in the New York-Florida Case in which NEA seeks extension to Miami. Hearings were scheduled to start in June.

TWA—Its bids to include Denver, Tulsa, and Oklahoma City as new intermediates on transcontinental Route 2 would be approved according to CAB staff proposals.

UNITED—Kansas City would be added to its Route 1 as a new intermediate.

Also, the Detroit-Philadelphia turnaround services would be authorized and restrictions on Fort Wayne-Toledo service would be removed.

WESTERN—A new segment would be added to Route 35 permitting service between Oakland/San Francisco and Denver via Reno and Salt Lake City.

In addition, there are other new cases coming along, such as the Eastern Route Consolidation Case, the New York-Louisville Nonstop Case, and the Texas-California Interchange Case which give promise of other adjustments.

Further, the local service lines, with permanent licenses assured, are headed for some better markets as a buttress against subsidy needs.

The nonscheduled airlines, too, may get their most definite answer from the Government as CAB brings the three-year-old omnibus case to an oral argument in July and possible decision in the fall.

Since, however, none of these cases have reached the five-man CAB for final decision yet, the smoke hasn't really begun to clear and about the only thing certain is that the domestic airline route map is in for its biggest change in the past eight years. • • •

How 3c Airmail Is Working

By ERIC BRAMLEY

Delivery of 3¢ mail in part of the Rocky Mountain area and in sections of New Mexico and Arizona has been greatly improved in the past year, but it is evident that a substantial segment of the public isn't fully aware of what has caused the improvement.

The reason, of course, is that first-class mail is being airlifted by Frontier Airlines on the Denver-Phoenix route. On a trip along the 758-mile route, during which people were interviewed in the intermediate towns, this reporter found:

• A surprising number of business people who should have been aware of the service, but weren't.

• Some businesses that were aware of it and were using it to their advantage. (A newspaper in Pueblo, Colo., is building circulation in some Rocky Mountain communities because its papers are now airlifted.)

• Confusion, caused by Post Office restrictions, as to when to use 3¢ mail and when to use airmail.

• Reluctance on the part of some business leaders to talk about the airlift because of railroad opposition. (Said a prominent bank president: "The airlift has been a tremendous boon to us. But I can't be quoted. One of our biggest depositors is a railroad. And we're awfully loyal to our customers.")

• Lack of any effective method of publicizing the airlift's advantages to combat the railroad campaign aimed at its discontinuance.

Frontier has hauled more 3¢ mail than any other local service line, and has done as much and probably more than the others to try to make the public aware of the advantages. On the first anniversary of the airlift, FAL staged celebrations in all towns receiving the service. Stories and pictures appeared in the newspapers.

• **During the first year,** ended March 10, FAL hauled 570,000 lbs. of 3¢ letter mail, newspapers, and surface parcel post marked "special handling" or "special delivery" (75% of volume was letters, 20% newspapers, 5% parcel post).

FAL's payment was $31,000—a payment the airline didn't receive because it was deducted from subsidy.

Denver-Phoenix 3¢ Airmail

Denver to	Scheduled Time Surface	Air	Time Saved	Mileage Surface	Air
Alamosa *	6:45	1:45	4:00	245	233
Durango *	11:45	2:45	9:00	391	338
Farmington *	16:55	3:11	13:44	442	337
Gallup	15:24	4:20	11:00	636	468
Winslow	17:20	5:20	12:00	764	560
Flagstaff	18:38	5:50	12:48	822	616
Prescott	29:30	6:20	23:10	964	671
Phoenix	34:30	7:00	27:30	1,073	758

** Only ground mail transportation from Denver to these points is via truck, departing Denver at 8:45 p.m.*

Surface mail is dispatched from Denver on Frontier's Flight 9, departing 4:50 p.m., compared with train dispatch at 12:01 p.m. for mail Gallup to Phoenix inclusive.

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Tollie Glaves, Frontier's mail superintendent, has estimated that delivery time saved amounted to 437,760,000 hours.

The rugged terrain and the mediocre surface transportation available make FAL's area an ideal testing ground for the airlift. That the public has benefited is evident from the statistics (see table).

From Denver to Durango, Colo., for example, is 391 miles by surface and 338 miles by air, a difference of only 53 miles. But Durango has no rail mail service; 3¢ mail not flown is transported by truck. And the road crosses the Rockies, including the Continental Divide. Consequently, FAL advances the mail by nine hours in good weather and much more in winter when the mountain passes are blocked. In the first year, FAL carried 42,195 lbs. into Durango and took 24,090 lbs. out.

• **Between the terminals** of Denver and Phoenix, train service is available—with two changes—on a schedule of almost a day and a half. FAL saves 27½ hours.

Frontier is authorized by the Post Office to carry 3¢ mail on only one afternoon trip daily each way. Had another trip been authorized, the first year's total would have been substantially more than 570,000 lbs.

In addition to expediting mail between the terminals and intermediates, FAL picks up big loads from the railroads. It connects with trains at Denver, Pueblo, Gallup, N. M., and Winslow, Ariz. Surface mail from New York and other eastern points to Phoenix is transferred to Frontier at Gallup, and delivery is advanced 24 hours. If it went all the way by surface, it would change trains or be transferred to a truck at Ashfork, Ariz.

Another Post Office restriction states that 3¢ letters, newspapers, etc., mailed on FAL's system will be airlifted only to other points on the system. Thus, a letter mailed in Durango for Denver goes by air, if it's in time for the afternoon schedule. But a letter destined for New York leaves Durango by surface (truck); it cannot be airlifted even part of the way, even though it might gain a day in delivery. The restriction has served to confuse the public.

• **Among those benefiting** from the airlift is the *Star-Journal* Publishing Corp. in Pueblo. William Barnwell, circulation manager, said the *Star-Journal*, an afternoon paper, is now delivered in Durango the same day. Formerly it went via overnight mail truck, with delivery the next day at 11 a.m. He now expects a substantial boost in Durango circulation.

Frontier's First Year
3¢ Airmail Results

	Pounds On	Pounds Off
Denver	38,683	157,507
Pueblo	74,414	54,332
Alamosa	13,543	20,664
Durango	24,090	42,195
Farmington	12,416	25,019
Gallup *	11,562	14,879
Winslow **	18,100	957
Flagstaff	15,209	2,464
Prescott	30,011	4,864
Phoenix	28,946	282,351

NOTE: Poundage estimated for February and first part of March.
** In addition to local mails boarded at Gallup, 197,927 lbs. were transferred from Santa Fe trains to Frontier.*
*** In addition to local mails boarded at Winslow, 152,273 lbs. were transferred from Santa Fe to Frontier.*

Also well aware of the service is William White, outspoken president of the Minnequa Bank, Pueblo, who also has banks in Alamosa and Durango. He has ordered that all his company mail in the state is to bear 3¢ postage; all other is to go air mail. Before the airlift, "dependability was the problem" on surface mail to Alamosa and Durango, but "now you know it'll be there the next morning," he said, adding: "I favor *all* mail by air, Period."

Across the mountains in the San Luis Valley at Alamosa (population 5,500), the impression was that people consider air transportation of mail as among their most vital necessities. But because of the isolation of the town, price is not a consideration. People are aware of the airlift, but they emphasized that their mail *must* go by air, whether it costs 3¢, 6¢ or double that amount.

Over the Continental Divide, and even more isolated, is Durango (population 8,500). Surface mail moves by bus and truck. Yet, a hotel clerk, two department store managers and a drug store operator weren't aware of the airlift. "Not enough publicity," said one of them, adding that he still uses air mail to Denver.

• **On the other hand,** C. J. Jeffers, circulation manager of the Durango *Herald-News,* reported noticeable improvement in delivery of papers to Denver, Phoenix, Farmington and other FAL points. The paper is also receiving quicker reaction to its editorials from out-of-town readers.

Schuyler Parker, Durango's postmaster, stressed the improvement in service and praised Postmaster General Arthur Summerfield for "having the nerve to try it (the airlift). From the taxpayers' standpoint, it isn't costing a cent." He added: "What we'd like to see is one first-class mail rate, with the fastest means of transportation used."

H. J. Thomas, local manager of Mountain States Telephone & Telegraph Co., said Durango's 3,800 telephone subscribers receive their monthly bills by mail from Denver, and that the airlift has advanced deliveries.

In Farmington, N. M. (population, 13,000), Mayor William H. Nygren was of the opinion that although the public may be aware of the airlift, it was confused as to which mail went by air and which by surface. Farmington is a junction point on FAL, with flights passing through to Salt Lake City, Albuquerque and other points not authorized for 3¢ mail by air.

• **In Phoenix,** L. S. Helms, Jr., sales manager of Colorado Fuel & Iron's office, said he's getting overnight delivery of first-class mail to the company's Denver sales office and Pueblo plant. However, he didn't become aware of the airlift until FAL's first anniversary celebration. Now he's using it and expects to cut his postage bill (almost $1,000 a year).

The 3¢ mail experiment on FAL is scheduled to end Jan. 11, 1956. And there are ample signs that the railroads are campaigning to assure that it goes no further. In addition to the bank president who wouldn't be quoted, chambers of commerce and others are aware of the rails' attitude. When the editor of a Denver financial journal praised the experiment he immediately received letters from two rail officials in the area.

• **How to publicize** the value of the service is a problem. The airline, on a limited budget, can't conduct a continuing campaign, and too-frequent news releases on the subject lose their news value. Chambers of commerce have, with some success, urged members to write postmasters and congressmen in support of the service. However, some of these organizations have railroad members.

Said one chamber of commerce official: "The railroads are standing in the way of progress, which is a poor place to be standing. Their position isn't very tenable. How has the public been made aware of the service? The answer is: In a very casual and not too effective manner. We certainly haven't beat the drums for it. If we did, repercussions (from the railroads) might be heard."

Another observer summed up: "When there's no crisis, it's hard to build up a head of steam for something. Probably the only way to arouse people would be to discontinue the service. When they started receiving their mail two or three days late, they'd get indignant. Only then it might be too late."

• • •

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Circle No. 32 on Reader Service Card.

Feeder Certificate Bill Becomes Law

President Eisenhower late last month signed legislation which assures the nation's local service airlines of permanent certificates.

The 13 operating carriers have four months to file applications for new certificates with issuance by CAB mandatory under the new law. Also included are the former Pioneer Airlines' routes now owned by Continental Air Lines.

The carriers plan to meet in Washington, D. C., on June 7 to formulate future plans. CAB Chairman Ross Rizley, on behalf of the Board, has promised to act expeditiously in implementing the new law.

The law, which is patterned after CAB Vice Chairman Joseph P. Adams' proposed "permanent skeleton routes," provides that all terminals will be permanent as will at least 50% of each carrier's intermediates.

Although the remaining intermediates may be continued on a temporary basis by CAB, early estimates indicated the number of permanent intermediates will be much higher than the 50% minimum.

The signing by the President represented a 180-degree reversal of fortunes of the local lines who, only one year ago, faced extinction under a Government policy critical of their subsidy needs. The carriers' plight last year stimulated Congress and permanency legislation resulted.

John F. Floberg, director of the Conference of Local Service Airlines, said the action "gives the carriers a chance to go to work." "There are no illusions in the industry," he continued, "that all problems are now solved. But we can move ahead in an atmosphere which at least permits us to seek solutions to the many problems confronting us."

Board Revises Policy On Atlantic Charters

Estimates of a boom year for transatlantic air charter business has led Civil Aeronautics Board to effect some revisions in its policy for the coming summer season. Termed a "liberalization" by the Board, the revision eases some of the restrictions in effect since 1951, but tightens others which generally are designed to preserve a high standard of regularly scheduled services.

Member Chan Gurney disagreed, asserting no "liberalization" is needed.

There were two major areas where the Board relaxed its rules. One was the abolishment of a requirement for an exemption that the proposed charter be essential to the success of the movement.

• **The other involved** the question of granting "first refusal" to regularly scheduled lines. In charters where one individual or one organization pays the charges or where furloughed military personnel are involved, the regular lines no longer will get first refusal.

However, where the charter is a "pro rata" trip, i.e. where passengers each pay a portion of the total charge, the scheduled lines get first refusal.

Simultaneous with the new statement, CAB instituted an investigation to determine if all foreign air carrier permits should be amended to include a provision permitting off-line charters.

• **Foreign lines** currently are restricted to charters on their routes and the Civil Aeronautics Act does not permit off-line exemptions.

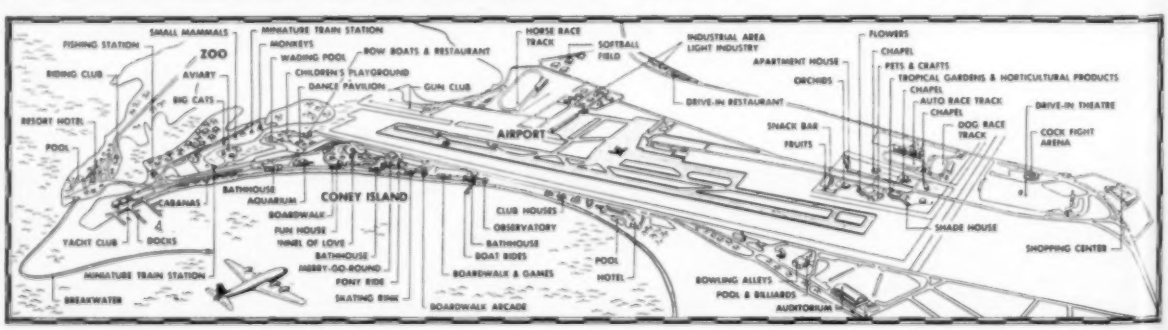
Gurney, meanwhile, said that "under our current requirements, scheduled transatlantic coach services have grown and prospered, while at the same time all legitimate charters have been handled satisfactorily. There have been no complaints from the traveling public.

"Under these circumstances, it seems to me that the present system is working well, and I believe it should be continued without change."

Passengers Pay 'Landing Fees' at New Airport

San Juan, Puerto Rico—The new Isla Verde airport serving San Juan was inaugurated May 22 and now is in full use by the nine scheduled airlines serving the island. Pending completion of its hangar, Caribbean-Atlantic Airlines will shuttle its aircraft back to the old Isla Grande airport for maintenance. The master plan for Isla Grande (below) is still a long way from completion. To date $15 million has been spent on airport, including $3,500,000 on the terminal built (left).

During the inauguration ceremonies, it was learned that all passengers arriving at the new airport from points outside Puerto Rico will be require to pay a 35¢ charge to meet the cost of providing facilities for U. S. government inspection services. The money will be taken by a collection company under arrangements approved by the airlines serving Isla Verde.



Airlines Report Top Executives Salaries

The following are among the airlines filing Schedule E reports with CAB listing the 1954 salaries, other compensation, and stockholdings of officers and directors:

• **Allegheny Airlines, Inc.**—Robert M. Love, chairman, board of directors, no salary (down $3,688); Leslie O. Barnes, pres. and dir., $16,666.72 salary (up $3,916.72); Everett K. Arnold, v.p. and secy., $10,000 salary (up $1,125); David L. Miller, v.p. traffic and sales and dir., $10,000 salary (up $1,021) (entered office April 27, 1954); Walter J. Short, treas., $10,000 salary (up $1,331); John S. Russell, Jr., asst. treas., no salary; Jean C. Langsdale, asst. secy., $3,600 salary (up $245).

• **American Airlines, Inc.**—C. R. Smith, pres. and dir., $73,185 salary (up $1,935); W. J. Hogan, Sr., v.p. finance, $47,707 salary (up $6,082); C. W. Jacob, Sr., v.p. and secy., $47,707 salary (up $6,082); O. M. Mosier, Sr., v.p. operations and dir., $47,707 salary (up $6,082); C. R. Speers, Sr., v.p. sales, $32,487 salary (up $8,612); G. J. Brandewiede, v.p., $31,714 salary (up $151); R. E. S. Deichler, v.p., $39,032 salary (up $907); L. G. Fritz, v.p., $36,593 salary (up $30); L. E. Glasgow, v.p. and comptroller, $23,562 salary (up $4,499); G. K. Griffin, v.p., $26,418 salary (up $2,543); W. H. Johnson, Jr., v.p., $26,418 salary (up $3,293); W. Littlewood, v.p., $26,835 salary (up $942); R. W. D. Smith, v.p., $28,941 salary (up $2,066); G. C. Van Nostrand, v.p., $16,338 salary (entered office May 19, 1954); Marvin Whitlock, v.p., $23,562 salary (up $4,312); P. G. Larie, treas., $21,706 salary (up $1,643); M. G. Beard, asst. v.p., $22,788 salary (entered office March 1, 1954); T. L. Boyd, asst. v.p., $25,000 salary (up $1,125); J. J. Casey, asst. v.p., $14,678 salary (entered office May 19, 1954); W. C. Lawrence, asst. v.p., $18,243 salary (entered office May 19, 1954); A. D. Lewis, asst. v.p., $17,322 salary (entered office May 19, 1954); G. E. Markt, asst. v.p., $13,917 salary (up $604); W. L. McMillen, asst. v.p., asst. treas. and asst. secy., $19,667 salary (up $2,417); M. L. Rinehart, asst. v.p. and asst. treas., $22,083 salary (up $3,020); E. O. Schroeder, asst. v.p., $22,083 salary (up $3,583); M. W. Shipley, asst. v.p., $14,923 salary (entered office Sept. 15, 1954); V. J. Long, asst. controller and asst. secy., $19,667 salary (up $2,417); C. N. Oursler, asst. controller, $18,077 salary (entered office March 1, 1954); A. A. Paradis, asst. secy., $12,833 salary (up $1,208); A. R. Bone, regional v.p., $22,083 salary (up $3,395); W. N. Bump, regional v.p., $22,083 salary (up $3,395); T. P. Gould, regional v.p., $22,083 salary (up $3,395); S. G. King, regional v.p., $22,083 salary (up $3,395); M. D. Miller, regional v.p., $22,083 salary (up $3,395).

• **Bonanza Air Lines, Inc.**—Edmund C. Converse, pres. and dir. $15,000 salary (up $15,000); L. G. McNeil, chrm. of bd., no salary; Florence J. Murphy, v.p., secy. and dir., $8,625 salary (up $500); R. H. Herrnstein, treas., $9,999.96 salary (up $9,166.96) (entered office Feb. 24, 1954); Vi Geer, asst. secy., $4,124.12 salary (entered office Feb. 24, 1954).

• **Braniff Airways, Inc.**—T. E. Braniff (deceased), pres., $806 salary (down $29,194), no bonus and indirect compensation; Mrs. T. E. Braniff (deceased), v.p., no salary, no bonus and indir.; C. E. Beard, pres., $33,750 salary (up $3,750), $2,396 bonus and indir.; J. W. Miller, exec. v.p., $31,175 salary (up $12,475), $2,203 bonus and indir.; R. C. Schrader, v.p., $14,313 salary (up $4,813), $938 bonus and indir.; C. G. Adams, v.p. and secy., $22,500 salary (up $1,500), $1,552 bonus and indir.; O. W. Crane, treas., $11,475 salary (up $675), $725 bonus and indir.; R. L. Barrier, asst. treas., $9,240 salary (up $420), $558 bonus and indir.; Loyd Eden, asst. treas., $9,240 salary (entered office 1954), $558 bonus and indir.; Velta Bowlware, asst. secy., $4,500 salary (entered office 1954), $203 bonus and indir.; F. J. Beisecker, asst. treas., $9,240 salary (entered office 1954), $558 bonus and indir.; W. A. Kropff, asst. v.p., $11,850 salary (entered office 1954), $754 bonus and indir.; R. K. Brack, v.p., $14,475 salary (entered office 1954), $408 bonus and indir.; J. M. Harrison, v.p., $12,075 salary (entered office 1954), $771 bonus and indir.; W. M. Henshel, v.p., $14,250 salary (entered office 1954), $934 bonus and indir.; R. V. Carlton, v.p., $21,500 salary (entered office 1954), $1,478 bonus and indir.

• **The Flying Tiger Line, Inc.**—Samuel B. Mosher, chairman of board, no salary, $600 bonus and indirect compensation; Robert W. Prescott, pres. and dir., $34,166 salary (up $4,166), no bonus and indir.; Lewis C. Burwell, Jr., v.p., $17,833 salary, no bonus and indir.; George T. Cussen, v.p., $12,489.64 salary (up $1,089.64), no bonus and indir.; W. E. Bartling, v.p., $16,600 salary (up $1,600); no bonus and indir.; Fred Benninger, secy. and treas., $20,166 salary (up $2,166), no bonus and indir.; Ralph B. Stump, asst. secy. and asst. treas., $11,300 salary (up $500), no bonus and indir.; Norman L. Meyers, dir. and asst. secy., no salary, no bonus and indir. (Note: all entered office October 2, 1954.)

CAB NEWS

Pending Cases

Hearings in the **New York-Florida Route Case** start in Washington June 6, in a two-part session. First, dealing with long-haul applications, includes Colonial, Peninsular, Northeast, North American, Capital, Delta-C&S, Resort, Riddle, Pan American, and Braniff. Second, dealing with local-type proposals, involves Eastern, National, TWA, and United.

Following a prehearing conference in the new **Eastern-Colonial Merger Case** two possibilities were existent. In one event, the case could move expeditiously to hearings on July 26, with issues limited to terms of the merger agreement. However, National Airlines opposes this procedure and threatened litigation could result in postponing the scheduled hearing date.

The **Great Lakes-Skycoach Enforcement Case**, in which hearings started in January, is currently snarled in litigation in the California courts over CAB's subpoena powers. U. S. District Court, Los Angeles, backed up CAB's right to enforce subpoenas served on various respondents in the case, but the decision has been appealed to the U. S. Court of Appeals, San Francisco. The CAB hearings, meanwhile, are suspended.

Calendar

June 13—Hearing, Helicopter Air Service Renewal Case. Wash., D. C. Docket 6916 et al.

June 21—Hearing, Eastern Air Lines Route Consolidation Case. Wash., D. C. Docket 3292 et al.

July 7—Oral argument, Large Irregular Air Carrier Investigation. Wash., D. C. Docket 5132 et al.

July 12—Hearing, New York-Chicago Surface-Mail-By-Air Rate Investigation. Wash., D. C. Docket 6881.

July 18—Hearing, Resort Airlines Renewal Case. Wash., D. C. Docket 6545.

July 26—Hearing, Eastern-Colonial Merger Case. Wash., D. C. Docket 6998.

Recent Decisions

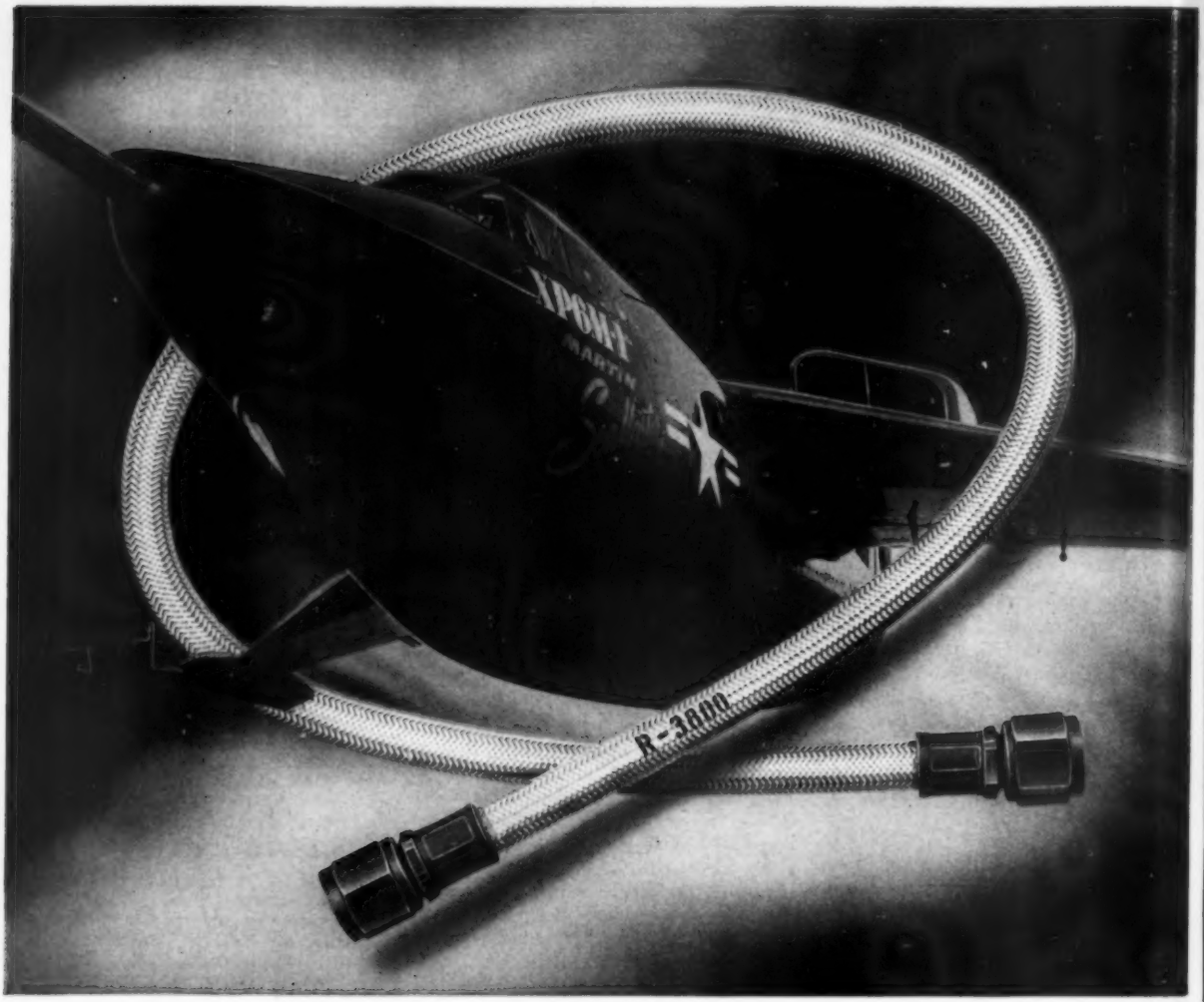
Western Air Lines Route 35 amended to include Sioux Falls, S. D. as a new intermediate between Huron and Brookings, S. D.

Aerovias Venezolanas, S. A. (Avensa) granted foreign air carrier permit for service between (a) Venezuela and Miami via Netherlands West Indies and Jamaica, and (b) Venezuela and New Orleans via Jamaica.

Applications

Riddle Airlines applied for certificate to carry passengers, cargo, and mail between San Juan, P. R. and Rome, Italy via The Azores, Lisbon, and Madrid.

Colonial Airlines has asked CAB to drop requirement that an Executive Committee handle management functions for the airline.



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Circle No. 33 on Reader Service Card.

Airline Commentary

By Eric Bramley

DOMESTIC airlines are making a little-publicized but important change in the method by which one carrier requests connecting space from another. At present, airlines handle this pretty much as they please; they can request space from the connecting carrier's local office, from the junction point, etc. Result has been duplicate reservations, over-sales and other fouled-up situations (we're told that one airline found itself holding 10 seats for one customer). On October 1, uniform procedures, too detailed to list here, become effective. It is a welcome and overdue step.

* * *

It may not be a trend, but it's interesting to note in some recent issues of weekly news magazines that railroad ads outnumbered airlines. The 1954 statistics show the need for some rail promotion.

Rail passenger revenue dropped 10.4% while airline revenue rose 12.7%. Domestic trunklines alone took in more passenger revenue than railroads (excluding commutation).

* * *

We nominate Al Crowder, Northeast Airlines' station manager at Portland, Me., for an award. In the back room at the airport, Al, who's been with NEA since before the war, has installed a full-length mirror for use by agents, flight crews and other personnel. Along the side of the mirror, from top to bottom, are questions: Hat clean and on straight? Hair neat? Shaved? Shirt clean and starched? Tie clean and neat? Blouse and jacket clean and neat? Black belt? Pants cleaned and pressed? Dark blue or black socks? Black shoes shined? We're told it's very effective. To head off another airline from claiming a "first" we hasten to add that we know, and have reported, that such a mirror, with different questions, is used for stewardesses.

But this is the first time we've heard of the broader application, so we still suggest the award.

* * *

Recent letter from a passenger to an airline:

"It's nice to learn that the reconfirmation rule is being canceled. Now if something can be done about that dipsy-doodle of standing in line to have baggage weighed, then standing in another line for ticket processing, it would really be an improvement." Amen.

Sales, Traffic, Promotion

Eleven airlines, including six local service carriers, will keep reconfirmation on all or parts of their systems, although the rule will no longer be mandatory after June 15. Retaining it on their entire systems will be Colonial, Northeast, Bonanza, Lake Central, Mohawk (which has altered reconfirmation time to three hours before departure instead of six), **North Central** and **West Coast. Eastern** and **Allegheny** will apply the rule at Atlantic City, N. J. Also, EAL, National and Delta-C&S will keep it for all cities in Florida, except that it will not apply at Miami for international passengers. . . .

A nationwide credit plan, providing installment credit facilities to the 13 local service airlines, has been announced by **American Airlines.** Local lines have been invited to participate under an agreement in which AA agrees to provide a package installment plan including promotional material and at the same time assume financial risks. Provision is also being made to finance trips involving other air carriers besides local lines. Plan was worked out in conjunction with Beneficial Finance Corp. . . .

KLM Royal Dutch Airlines is distributing a "plan-it-yourself" folder listing 100 European trips. From the folder, entitled "Europe 100," a traveler can plan his own tour, then turn it over to a travel agent to put into operation, KLM says. . . .

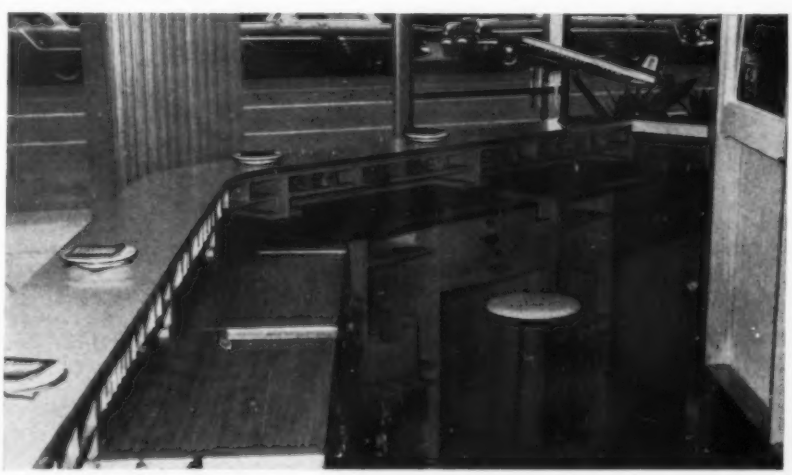
Swissair has launched a new direct-mail campaign to familiarize travel agents and others with its "pay later" plan. The campaign, built around cartoon characters, consists of 12 humorous mailing pieces in greeting card form. . . .

A 46% gain in winter traffic U. S.-Europe will result from adoption of the off-season family plan on Atlantic routes, predicts **Willis Lipscomb, Pan American's** vice president-traffic and sales. A PAA survey last fall among 1,877 married men flying to Europe indicated that 12% took their dependents with them. If a family plan had been available, 33% would have taken their families. Lipscomb also pointed out that European hotels and resorts cut rates 20% to 25% in winter and sightseeing charges and other costs are reduced . . .

Air Transport Association has issued an informative folder on advantages of using AO mail ("articles other than letters and postcards") for some international shipments. It points out how money can be saved by sending commercial papers, printed matter, books and other eligible articles via AO instead of air parcel post. . . .

An "executive" theme will be used by **Allegheny Airlines** in its promotion and advertising. Route system will be called "The Route of the Executives" and/or "The Airline of the Executives." Company's newly-acquired Martin planes will be named "Martin Executives." Theme was adopted after a traffic survey showed 80% of passengers traveled for business reasons. . . . **Trans-Texas Airways** is installing portable air conditioning units for pre-cooling planes on the ground at Dallas, San Antonio, Corpus Christi, Little Rock, Memphis and Mission-McAllen-Edinburg. . . .

Western Air Lines has established seven major sales districts to serve the greater Los Angeles area, which now covers 4,862 square miles. Under **Keith Jones,** who has been named regional sales manager, are district managers in Long Beach, East Los Angeles, Pasadena, Hollywood, metropolitan Los Angeles, the Valley, and West Los Angeles. . . . **TWA** and **National Airlines** have opened a joint ticket office in the Statler Hotel, Washington. . . .



THIS TYPE of ticket counter is to become standard on Delta-C&S Air Lines' system. First installation, shown above, is in the company's office in Hotel Peabody, Memphis. Office has just been remodeled and expanded at a cost of $26,000.

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Rains Disrupt Rails, Airline Takes Over

The airlines, for the second time this spring, have stepped in to keep the U. S. mails moving in the face of disrupted rail service. Newest occurrence was late last month in Texas where the Post Office Department called on Trans-Texas Airways to fill the gap created when heavy rains washed out surface transportation.

TTA began the airlift at the special local service airline rate of 30¢ per ton-mile; American Airlines and Continental Air Lines were standing by for use if necessary.

Earlier, during the L&N Railroad strike, five air carriers were used by the PO to keep the mail moving. Since the trunklines had no rates for moving surface mail in that area, the situation permitted the PO for the first time in history to invoke emergency powers which permit it to contract with the carriers for a rate after the service has started.

In the L&N case, the PO and airlines agreed on a rate of 28.5¢ per ton-mile which is about midway between the 19-20¢ rate for current 3¢ mail experiments and the 38¢ airmail rate.

PMG Arthur E. Summerfield noted the Trans-Texas emergency lift with a statement that: "This is a splendid example of one important segment of the overall American transportation picture jumping in to assist another important segment so that vital service to the American people is not brought to a halt by an act of nature."

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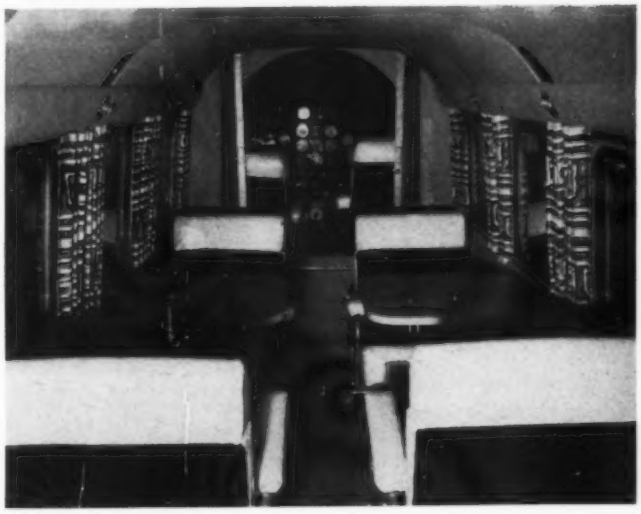

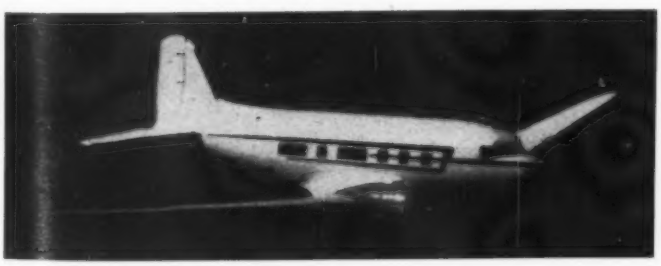

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Thirteen More Airports; Only 122 to go!

My hobby of trying to depart from or arrive at every airport in the U. S. on regular airline schedules is beginning to pay off. I'm beginning to collect loot.

The Air Traffic Conference was meeting in Boston recently and our outfit gave a cocktail party to help launch our Worldwide edition of the Official Airline Guide, so I took the occasion to hit 13 new airports on Mohawk and Northeast. (Total to date, 428, with 122 yet to go.)

I took Colonial from Washington to Binghampton, transferred to Mohawk for Ithaca, and spent the evening with Mohawk's Bob Peach and wife, Helen Thomas, executive assistant, and Leo Murphy, pubrel director, went through Mohawk's shops and had a fine dinner at the Statler Inn on the Cornell University campus.

Into New Hampshire

Next morning at dawn Tom Kirkup, general traffic and sales manager, picked me up, took me by his house for some bacon and eggs, and then we took the Mohawk milk run to Auburn/Geneva, Elmira, Binghampton, Utica, Albany, Pittsfield, Westfield/Springfield, Worcester, and Boston. A fine flight over some good country with Capt. R. W. Jenkins, 1st Officer W. T. Gilcannon, and Steward R. T. Sidney.

Next morning Al Swett, NEA's dsm for Boston, took me to the airport where Dick Eckert, ass't director of stations was ready to accompany me to Concord, Laconia and Berlin, all in New Hampshire.

Arriving at the state capital of Concord there was a delegation to welcome me into the state. In addition to those in the photo below were Bob Williams, NEA's dsm; Ed Adams, station manager, and Gardner Mills, assistant to Russ Hilliard. The assistant to Governor Lane Dwinell presented me with a big packet of handsome maps and folders, and a can of 100% pure New Hampshire maple syrup.

But weather closed in over Berlin and we had to turn back to Boston, so I've got to go back up there one of these days. I found out, incidentally, that you pronounce New Hampshire's Berlin with the accent on the first syllable. At Concord on the way back I met Lee Bowman, the well-known fixed base operator of Keene, N. H., who was over for the day with Armando Roberti, the operator at Montpelier.

In Boston I can recommend some good food. Loch-Ober's, a famous old spot, lived up to its reputation. And at the Parker House I found a really good chicken pie minus those useless mushrooms so often found in that dish.

Maine From the Air

Next morning with weather still dubious Dick Eckert and I started out for Presque Isle at the end of the line in Maine, the only one of the 48 states I had never flown in. At Portland I met an old-timer with Northeast, Al Crowder, the able station manager there. We passed over Auburn/Lewiston because of low ceiling but landed okay at Augusta, the state capital.

Chest of Seafood

Here was another delegation, as per the photo below. Governor Edmund S. Muskie had sent out a fine treasure chest of Maine seafood. Incidentally, I think Augusta has the lowest airport cab fare in the country—only 35c.

Next stop was Bangor, where Gene McCarthy, NEA dsm, had lined up Ed Moody, 75, who flew with Orville Wright in 1907, for a photo for the local paper. By this time I was wondering whether I was flying for fun or running for office.

There were still some snow patches in the northern country to Houlton and Presque Isle where it was quite chilly. After a quick turnaround we headed south nonstop for Boston with almost a full load. Then I transferred to an NEA Convair for New York. So did the crew, Capt. Pete Green, 1st Officer George Place, Jr., and Stewardess Jean Anderson. I'll be back to pick up those missed stops, NEA, and thanks for the hospitality.

WELCOME TO NEW HAMPSHIRE—At the capital airport of Concord, WWP is officially welcomed by Allan N. Pope, Administrative Assistant to the Governor. At left is Russell Hilliard, the state's well-known and capable director of aeronautics. At right are NEA's Capt. Lloyd Fiske and 1st Officer L. J. Balestra. Just out of camera range: Stewardess Arline Cole.

WELCOME TO MAINE—At Augusta, WWP gets some seafood and an official welcome. Left to right, Mayor Brooks Brown, Jr. of Augusta; Everett W. Greaton, director, Maine Development Commission, representing the Governor; WWP; Leighton A. White, NEA's station manager; Miss Jean Anderson, NEA stewardess; and Scott K. Higgins, Maine's live-wire aeronautics director.

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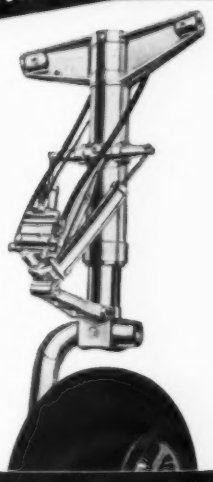

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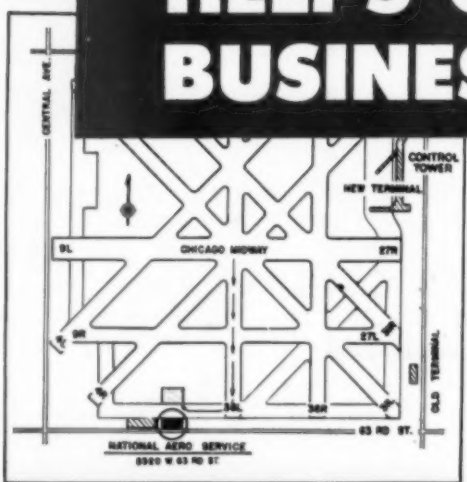

POPULAR and widely known Bill Smith (left) and Howard Cranich (right), shown here with W. Eddington, are the National Aero's service experts. They have complete aircraft repair and instrument overhaul facilities for business planes including DC-3s and Lodestars. Latest mobile equipment for fast in-and-out servicing includes a fleet of special trucks for Texaco Aviation Fuels and Lubricants.

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